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# Demographic Correlates with the Breastfeeding Practices of Adolescent Mothers

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# Demographic Correlates with the Breastfeeding Practices of Adolescent Mothers

**by**

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## Dedication

*This dissertation is dedicated to my loving and supportive children, husband, parents, and grandparents. It is further dedicated to all of the wonderful people who cared for me and my children over the years as I worked towards this goal.*

*May I put all of your support to good use,*

*and make the world a better place for our children.*

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# Demographic Correlates with the Breastfeeding Practices of Adolescent Mothers

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The purpose of this dissertation was to investigate the infant feeding choices of adolescent mothers. Past research has shown that breastfeeding provides substantial benefits over formula in many areas, including economic, physical, psychological, and developmental. Research suggests that adolescent mothers and their families are particularly at risk for problems in these areas. While it is clear that adolescent mothers choose to breastfeed less than their older counterparts, little is known about the differences in breastfeeding initiation and duration within the adolescent mother population. This dissertation addressed this issue by investigating the relationships between breastfeeding initiation and duration and the following demographic variables: maternal age, maternal marital status, maternal educational attainment, household income, race/ethnicity of mother or child, number of child's siblings, birth hospital, birth

method, and admittance to the Neonatal Infant Care Unit. I also analyzed a small qualitative sample of adolescent mothers' reasons for their feeding method of choice.

I found that for adolescent mothers, there may not be significant differences in breastfeeding trends according to age, maternal educational attainment, or household income. Adolescent mothers who were married at the time of birth were much more likely to breastfeed their children. Adolescent mothers and their children who were from a Hispanic background were the most likely to initiate breastfeeding, while those from an African-American background were the least likely to initiate breastfeeding. However, adolescent mothers of all race/ethnicities breastfed for approximately the same length of time. Children with siblings were less likely to be breastfed than children without siblings. The hospital where a child was born was related to breastfeeding rates. Vaginal births were related to higher breastfeeding rates than cesarean births, and children admitted to the Neonatal Infant Care Unit (NICU) were breastfed more often in the beginning than those not admitted to the NICU. Almost half of the mothers who responded to the qualitative interview said they stopped breastfeed within the first three weeks because it hadn't worked for them or their child.

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# Chapter 1: Review of the Literature

This chapter provides the theoretical and empirical context of the dissertation. I begin by reviewing the general state of adolescent motherhood and breastfeeding in the United States. I follow with an in-depth discussion of the psychological path of adolescent mothers as it differs from either the standard adolescent developmental trajectory or the normal changes older mothers experience in the transition from non-mother to mother. I specifically discuss changes in terms of identity and intimacy development. I end with a comprehensive review of the literature discussing demographic differences associated with breastfeeding rates.

## Introduction

Approximately one million teenagers in the United States become pregnant every year. About half of those pregnancies end in abortion or miscarriage, and the other half are carried to term (National Campaign to Prevent Teen Pregnancy, 2002). Adolescent mothers and their children have been shown to be at a high risk for numerous economic, physical, psychological, and developmental problems. Adolescent mothers are more likely to be single, to live below the poverty level, and to have lower educational attainment (National Campaign to Prevent Teen Pregnancy, 2002). They are more likely to abuse or neglect their children (Miller, 1984) and both they and their children are likely to have decreased physical health (Maynard, 1997). Research indicates that, when compared to older mothers, adolescent mothers interact more negatively with their infants (Culp, Appelbaum, Osofsky, & Levy, 1988), are less knowledgeable about child

development (Roosa & Vaughan, 1984), and are more likely to feel that they are unable to directly influence positive change in their children's negative behaviors (Roosa & Vaughan, 1984).

However, even amid the negative consequences of adolescent motherhood on both the mother and the infant, motherhood can have positive influences on adolescent mothers, such as increased familial status and increased stability (Bucholz & Gol, 1986; Davies, McKinnon, & Rains, 2001; Jacobs, 1994). Research has, by and large, focused on the negative sides of adolescent motherhood rather than the positive sides, perhaps because adult researchers are not able to focus on the positive sides of what they believe to be a generally negative situation (Nathanson, 1991; Luker, 1996).

Nevertheless, given the negative consequences of adolescent motherhood for both mothers and children, understanding more about adolescent mothers may shed light on which teenage mothers do well and why, and may suggest possible interventions and ways to evaluate those interventions according to their ability to improve the economic potential, physical health and wellbeing, and the psychological developmental trajectory of adolescent mothers and their children.

Investigations into adolescent mothers' infant feeding choices is one area in the adolescent mother literature which needs substantial expansion. Breastfeeding is correlated with a wide range of beneficial outcomes that could be particularly applicable to adolescent mothers and their children, including reduced cost when compared to formula, increased physical health for both mother and child over time, high-quality mother/child bonding, and reduced levels of child abuse (Gartner & Black, 1997; Klaus,

1998). However, there has been relatively little discussion of adolescent mothers' feeding choices, either in the literature about adolescent mothers or the literature about infant feeding choices (Dykes, Moran, Burt, and Edwards, 2003). Additionally, there are significant differences in the breastfeeding literature that have remained uncommented on by theorists, but have the potential to provide substantial insight into adolescents' feeding choices in particular. Specifically, these points include the reasons adolescent mothers give for their feeding choices, educational attainment, and WIC enrollment.

Expanding the research base in this area will hopefully provide a baseline understanding of the infant feeding decisions of adolescent mothers and how those decisions vary according to a variety of demographic variables. This will allow subsequent researchers to (1) evaluate the efficacy of interventions designed to support increased breastfeeding rates among adolescent mothers and (2) probe more deeply into the influences on adolescent mothers' infant feeding decisions.

Adolescent development theorists have suggested that research regarding adolescent mothers should be set within an understanding of adolescent psychological development. Therefore, this dissertation will use Erik Erikson's broad theoretical understanding of adolescent psychology as a framework for discussing adolescent mothers' infant feeding decisions (Erikson, 1968). John Bowlby and Mary Ainsowoth's theories on attachment will augment Erikson's theories by defining what constitutes a high- or low-quality relationship between mother and child (Karen, 1994). Current feminist theories will provide a social commentary both on Erikson's theory and

attachment theory, and on the form of research addressing adolescent mothers (Davies et al, 2001; Nathanson, 1991; Luker, 1996).

This dissertation will address how a variety of demographic variables, including adolescent status of the mother, mother or child's race/ethnicity, mother's educational attainment, and WIC enrollment, correlate with adolescent mothers' feeding choices. Researchers have indicated that these variables are significantly correlated with adult mothers' infant feeding choices, but have left them undiscussed in the adolescent mother literature. More precisely, one group of researchers has previously analyzed data about adolescent mothers' feeding choices and their relationship to a variety of variables (Li, Darling, Maurice, Barker, and Grummer-Strawn, 2005), but those researchers did not set their analysis within the literature on either adolescent mothers or adult mothers' infant feeding choices. Nor did they address some of the other variables incorporated into this analysis, including maternal age within the adolescent spectrum, exact numbers of siblings, birth hospital, birth method, and child's admittance into the Neonatal Infant Care Unit.

I hypothesize that, because adolescent mothers are addressing two significant developmental stages at once (i.e., adolescence and motherhood), they will not be as effective as older mothers, who are only addressing one significant developmental stage, at making reasoned choices for their babies. Therefore, I expect to find that older adolescent mothers (18 – 19 at birth of baby) breastfeed significantly more often than younger adolescents (11 - 15 at birth of baby) because their decision-making may be more closely related to that of adult mothers rather than younger adolescent mothers. In

accordance with previous research with older mothers, I expect to find significant differences in breastfeeding rates among adolescents with different marital status, educational attainment, household income, WIC enrollment status, race/ethnicity, and number of siblings. However, because most of these issues have not been fully developed in the literature, it is not completely clear how they will be related to adolescent mothers' breastfeeding rates. There are several variables which will be included in this analysis that have not been previously analyzed in relation to breastfeeding rates with adolescent mothers include birth hospital, birth method, admittance to the NICU, and reasons adolescent mothers give for their feeding choices. The relationship between birth method and breastfeeding rates has not been previously studied with adolescent mothers or adult mothers.

**Influence of Motherhood on Adolescent Psychological Development**

Researchers often examine adolescent mothers in the context of their role as mothers. However, it has been argued that adolescent mothers cannot be understood except within the context of their psychosocial development as adolescents (Hubbs-Tait, Osofsky, Hann, & Culp, 1994). Therefore, this discussion of adolescent motherhood will address the differences in psychological development as compared to non-parenting adolescents and older mothers in order to set the stage for discussing adolescent mothers' infant feeding choices. Adolescent mothers' identity development will be analyzed through Erik Erikson's theory of identity crisis and will be developed with discussions of societal beliefs, self-concepts, and self-esteem. Adolescent mothers' intimacy development will be analyzed through Erik Erikson's theory of the crisis of intimacy

versus isolation and John Bowlby's theories of infant and adolescent attachment, and will be developed with discussions of gender roles and sexuality.

Before Erikson's theories can be applied to a deeper understanding of the psychological development of adolescent mothers, however, his theories on gender, and how they are used here, must be discussed. Erikson's (1968) theories on gender and adolescent development are complicated, and indicate lower levels of psychological development for girls when compared to boys (Rich, 1995). This is important because the gender work that has come since Erikson was forming his theories shows that male-dominated theories can have a negative impact on women. Much of the literature that discusses Erikson and adolescent development does not mention the gender differences that Erikson delineated. Indeed, Erikson's (1950) often referenced chart of the eight states of psychosocial development refers only to boys' psychosocial development. Erikson (1968) suggests that adolescent girls' socioemotional development is more integrated, with intimacy and identity emerging in tandem with the developmental stage of generativity, which Erikson says is the "concern for establishing and guiding the next generation" (Erikson, 1968, p138). The implication is that young girls develop their sense of identity and intimacy through their desire to have children, while boys develop identity and intimacy through their interaction with friends and society.

The feminist movement and theory development have significantly reconceived female adolescent development in the past forty to fifty years since Erikson formulated his views (Rich, 1995). Given these changes, Erikson's male model of psychological development may be more appropriately applied to young women than his female model.

Indeed, researchers have often applied the male model uniformly across both genders, and have generally not discussed the differences in genders in Erikson's original theory.

This is not the place for a full analysis of the issues involved in gendered development according to Erikson, but can be found elsewhere (Gilligan, 1982 and Millett, 1970). The present discussion and application of Erikson's theories in the analysis of adolescent mother's psychological well-being will follow suit with most current research which draws on Erikson's adolescent development theories, and use his theories on adolescent boys to explain adolescent girls as well.

Erikson (1968) frames psychosocial development in terms of a series of crises that must be appropriately resolved before the individual is able to move successfully into the next phase of development. Erikson suggests that the crisis of adolescence is the challenge of forming a sense of identity, namely the process of coming to an understanding of one's personality, goals, tendencies, and history.

The process of resolving this crisis includes a number of factors. Most broadly, the adolescent must "make a series of ever-narrowing selections of personal, occupational, sexual, and ideological commitments" (Erikson, 1968, p. 245). This process involves the adolescent gaining an understanding of herself in terms of her past actions and her future aspirations. The adolescent must also consider herself a person of value or worth. Establishing a firm identity and understanding of self is an important step to motherhood so that the mother is able to integrate motherhood into her identity in a homogeneous way that incorporates both positive and negative attributes (Raeff, 1996). Generally, this means that the mother will accept that initiation into motherhood brings

both good and bad changes, and will integrate motherhood into her identity across her identity framework, rather than being unaccepting or dismissive of the impact of childrearing on some aspect of her life.

Erikson suggests that the crisis of young adulthood is intimacy versus isolation. Intimacy is the ability to share one's self within the context of a personal relationship, without losing one's own identity (Hurlbut, McDonald, Jambunathan, & Butler, 1997). Erikson believed that before true intimacy can be developed, individuals must have a firm sense of positive role identity, and therefore that adolescents are not yet developmentally ready for truly intimate relationships (Erikson, 1968). Not having achieved the ability to form such relationships has profound implications for the highly intimate mother-child relationship. Erikson suggests that only after identity and intimacy crises have been appropriately resolved is parenting developmentally appropriate.

Both identity role development and intimacy development may be critical to a mother making the best infant feeding choices. When a mother is breastfeeding her infant, her role as mother is established in a very public way. As the sole or primary individual feeding a baby, the adolescent may be seen by society first in her role as a mother, and second as a young woman. Furthermore, because of the need for physical contact between the mother and infant every two to three hours, the intimacy that is developed within a breastfeeding dyad may be stronger and more intense than that which is developed between a mother and infant when formula is used. However, there is very little research on intimacy or identity, or indeed most psychological concepts, and how they interact with a breastfeeding versus formula feeding mother/infant dyad.

Research has indicated that a mother's psychosocial developmental level influences her ability to parent, and that adolescent mothers do not maintain the same psychosocial developmental track as adolescents who are not mothers (Ketterlinus, Lamb, & Nitz, 1991). Ketterlinus et al. (1991) point out that adolescents have not yet reached adult developmental maturity in a variety of social and cognitive areas. It is often during adolescence that individuals progress from concrete to formal operational thinking, and thus become more able to think about the past, present, and future in an abstract way (Piaget, 1972). Adolescence is also a time when many people gain a sense of identity and self, which allows them to form stronger relationships with friends and family, including their children (Erikson, 1968). Ketterlinus et al. (1991) theorize that this affects a young woman's ability to parent because many mothering tasks draw on a woman's social and cognitive abilities to respond, guide, and make choices for her child in appropriate ways. For example, a mother's choice to breastfeed has wide ranging implications that a mother must consider when deciding how to feed her infant. A more developed cognitive ability and a stronger sense of self and beliefs may aid a mother in making an appropriate decision. Ketterlinus et al. (1991) further suggest that with much of an adolescent's energy and attention being diverted to parenting tasks rather than developmental tasks, young mothers will not be able to progress as far in their cognitive and social development as adolescents who are not mothers.

Social and cognitive development affect and are affected by a wide range of decision-making areas, notably including adolescent reproduction and parenting. Adolescent mothers who postpone subsequent childbirth are more likely to graduate from

high school and to reduce their reliance on welfare by the time their child is school-aged (Seitz & Apfel, 1999). This has the positive benefits of better material and social life outcomes for their children, including higher school achievement (Apfel & Seitz, 1996, 1997). Rapid repeat childbirth also has important implications for a mother's economic viability.

However, adolescents who already have children do not always make the choice to consistently use reliable birth control and thus increase the likelihood of additional children. The reasons they give for their choices are not always couched in preventing subsequent pregnancy and the possibility of contracting an STD, but may have more to do with navigating relationships with their partners (Davies et al., 2001). When asked, some adolescent girls say they do not use reliable birth control because their sexual partners believe the desire to use birth control is based on promiscuity, and therefore indicates the young woman is being non-monogamous.

The inappropriate decision-making processes used by these adolescent mothers in regards to something as relevant and potentially life changing as pregnancy and disease prevention may also be relevant when discussing adolescent mothers' infant feeding choices. For example, the false causality of a desire to use birth control as an indicator of infidelity may also be used to undermine a decision to breastfeed. An adolescent mother may believe that her baby wants to eat every two to three hours because she is not getting enough breast milk, even though babies need to eat that often because of their relatively small digestive systems. This false causality may make her decide to switch to feeding

her child formula rather than accepting the task of feeding her at regular, appropriate intervals.

In summary, adolescent mothers are situated in a distinct psychological developmental stage. Undertaking the task of understanding these young mothers requires taking into account adolescent psychological capabilities, such as the crises of identity and intimacy that Erikson identifies, the resolution of which he sees as important precursors to parenthood. Nevertheless, adolescents continue to give birth to and raise children in high numbers in the United States. Consequently, it is important to gain an understanding of adolescent psychosocial development within the context of parenthood. Adolescent mothers' gender role identity and sexual expression and maturity also have the potential to impact both the mothers themselves and their children. Therefore, this discussion of the psychology of adolescent mothers will address the development of adolescent mothers' identity and intimacy development, as well as how gender roles and sexuality interact with adolescent motherhood. This discussion will serve as the theoretical scaffolding for the following discussion on adolescent mothers' infant feeding choices.

**Identity**

Identity formation is a key focal point of adolescent development. There are three primary reasons that identity formation is a focus in normal adolescence: (1) the onset of puberty, (2) increasing cognitive complexity, and (3) changes in social roles. Puberty leads away from childhood and towards an adult identity because the adolescent begins to look more like an adult than a child and society responds to these changes by treating the

adolescent more like an adult (Steinberg, 1999). An increase in cognitive complexity, primarily the increased capacity to reason according to moral principles such as equality, justice, and fairness, allows the adolescent to think more deeply about morality, relationships, and other problems, as well as about herself: who she is, who she has been, and who she wants to be (Kohlberg, 1976; Steinberg, 1999). As part of the transition to adulthood, adolescents are expected to take on more responsibility and are in turn given more choices and freedoms. These changes often lead to the adolescent questioning who she is, what choices she will make, and why (Erikson, 1968). The combination of puberty, increased cognitive complexity, and changes in social roles leads to the adolescent questioning her identity. This identity crisis is particularly difficult to resolve when an adolescent is also incorporating motherhood into her identity (Hurlbut et al., 1997).

Just like entering adolescence, the advent of motherhood can also be a cause of identity-related changes for women. Regardless of the age of the mother, women have been shown to renegotiate their relationships with others during and after pregnancy. For example, some women making the transition to motherhood will focus inward and turn away from larger social circles to attend to themselves and their family (Antonucci & Mikus, 1988). Smith (1999) found that women who turn away from larger, more public involvements during pregnancy tend to focus on only one or two individuals aside from themselves and their families, such as a teacher or a friend. However, research has shown that there is variability in the social orientation of pregnant women. For example, Raphael-Leff (1991) found that some women do not turn inwards at all, but focus

externally during pregnancy. The women of this subgroup become much more social and outgoing during their pregnancies, and seek out a wider community to engage in. Thus, while pregnancy is often an instigator of identity change, the form of the identity change that takes place may vary from woman to woman.

***Effects of Societal Beliefs***

In addition to the cumulative effect of these life changes, societal beliefs may complicate adolescent mothers' identity development. Our society has complex and conflicting views on young motherhood, centering on preconceptions in three primary areas: (a) life-phase expectations, (b) cultural representations of young motherhood, and (c) common cultural representations of motherhood as a normative adult role (Raeff, 1996). Life-phase expectations for adolescents include establishing and maintaining friendships (Gilligan, 1982; Gilligan, Lyons, & Hammer, 1990), being in transition from childhood to adulthood (Offer, Ostrov, Howard, & Atkinson,1988), and a heterogeneous, or variable, concept of the self (Marcia, 1966; Waterman, 1982, 1985). There are key differences in the cultural representations of motherhood that depend on the age of the mother. For example, the cultural representations of young motherhood include assumptions that the mother is not mature enough to take care of her child (Raeff, 1996), that she has inconsistent emotional and physical support from her family (Polakaw, 1993; Sander, 1991; Wasserman, Brunelli, Rauh, & Alvarado, 1994), and in some groups has the possibility of raising the adolescent's status within the family (Dunston, Hall, & Thorne-Henderson, 1987). In contrast, the common cultural representations of mothering as an adult role assumes that motherhood is a valued social role for adult women, that

adult women will be primarily responsible for their children, and that mothers will establish and maintain a strong relationship with their children (Raeff, 1996). Integrating these many and varied societal preconceptions into a new view of the self can be an additional and substantial stressor on a young woman when she already has few extra resources at her disposal.

### *Self-concepts*

Because of the additive and complex influence societal beliefs have on young mothers, adolescent mothers experience different identity related issues, separate from both non-parent adolescents and older mothers. In addition to the broad concept of identity formation, there are two key identity-related constructs that are particularly crucial for adolescent mothers: self-concept and self-esteem (Steinberg, 1999). Self-concept is the way an individual thinks about and characterizes herself. Self-esteem is the way an individual feels about herself. Both constructs have been linked to parenting efficacy for older mothers (Shapiro and Mangelsdorf, 1994; Simon, 1992).

#### *Adolescents' Self-concepts*

Self-concept in adolescence is noted for its increasing complexity. Prior to this stage, girls tend to characterize themselves in fairly simplistic terms: when asked who they are, girls often discuss objects they own and games they enjoy. As they begin to reach adolescence, girls are much more likely to provide personality descriptions like funny, quiet, and intelligent (Steinberg, 1999). These descriptions are increasingly likely to be contradictory and context-specific (Feldman & Elliott, 1990). This deeper

knowledge of self allows for a more accurate view of self than a child possesses (Harter & Monsour, 1992)

### *Adult Mothers' Self-Concepts*

Research has indicated that mothers' self-concepts are closely tied to the maternal role (Simon, 1992). Adult mothers' maternal self-conceptions are more internally consistent and more highly related to the mother-child relationship as it is played out in daily life if the mother-child attachment is secure (Bretherton, 1990). Adult mothers have been shown to have stable self-concepts that include both positive and negative aspects of self (Raeff, 1996). Examples of positive aspects of self include being happier and more mature, while negative aspects of self include feelings of isolation and incompetence.

### *Adolescent Mothers' Self-Concepts*

There have been few studies investigating self-concepts of adolescent mothers. In one study, Raeff (1996) investigated differences between adolescent and adult mothers' self-conceptions. She suggested that because motherhood has both good and bad influences on the mother's life (such as playing with the baby versus decreased freedom), integrating positive and negative aspects of the maternal role is primary to viewing motherhood as part of the mother's identity. While adult mothers had consistently stable, homogenous self-concepts as a group, individually they were able to integrate both positive and negative aspects of the maternal role. However, Raeff found that adolescents integrated the maternal role in various ways across the group, and that

adolescent mothers' self-concepts could not be classified into one broad descriptive category. Raeff's study involved intensive interviews with the participants, and so included only fourteen mothers (six adolescent mothers and eight older mothers). And yet, even with this small N, the adolescent mothers showed markedly different self-conception patterns when compared to the older mothers. Two of the young mothers in the study had self-conception patterns similar to older mothers, two viewed their motherhood as external to their identities, and two were unsure how motherhood fit into their identities. The differences in adolescent mothers' integration of motherhood into their self-concepts reveals a high level of variability among adolescent mothers. This suggests there may be significant variables, such as maternal age at first birth, ethnicity, prenatal care, and income, which may have significant influences on adolescent mothers' psychological well-being in addition to the psychological transitions they encounter in adolescence.

***Self-concept and Maternal Infant Feeding Choices***

Regrettably, none of the research that discusses maternal self-concept integrates a discussion of infant feeding methods into their discussion on any level. However, while it is unclear how these two variables might relate, it seems likely that they may have a relationship. The way a mother, regardless of her age, chooses to feed her baby is often a political and social act. Indeed, much of the highly publicized "Mommy Wars" have been related to several key topics, with working outside the home and how you feed your baby as absolutely key to all sides. Mothers' self concepts may revolve around these decisions, and particularly for the mother who found herself unable to breastfeed when

she had planned to, her maternal self-concept may be put in jeopardy. Nevertheless, a relationship between self-concept and maternal infant feeding choice remains theoretically possible, perhaps even probable, but still untested.

### *Self-esteem*

Self-esteem can generally be defined as "our sense of self-worth, perceived value, or how much we like ourselves" (Neff, 2004, p. 31). Researchers have commonly used self-esteem to describe a generally healthy psychological self-attitude (Coopersmith, 1967; Harter, 1999).

#### *Adolescent Self-Esteem*

There is a prevailing cultural belief that adolescents have low self-esteem, and that it fluctuates continually during adolescence (Steinberg, 1999). However, longitudinal research has indicated that baseline self-esteem, or long-term self-esteem, fluctuates in preadolescence, and then rises slowly and steadily from the seventh through twelfth grades (Feldman & Elliott, 1990). However, barometric self-esteem, or context-specific self-esteem, is more likely to vary throughout adolescence (Steinberg, 1999). Both baseline and barometric self-esteem are more likely to decline or change dramatically during early adolescence than middle or later adolescence (Feldman & Elliott, 1990; Steinberg, 1999). The increased likelihood of self-esteem volatility during early adolescence may make it particularly important to separate early and late adolescents into different groups when researching adolescents and teenage mothers.

### *Adult Mothers' Self-Esteem*

Self-esteem in adult mothers, rather than steadily increasing over time or being somewhat transitory as it is in early adolescence, is generally consistently strong when a mother has a support network (Shapiro & Mangelsdorf, 1994). When the mother has support from both the baby's father and her family of origin, her self-esteem is generally strong. However, the research investigating changes in self-esteem in congruence with the transition to motherhood is extremely sparse, which may make it hard to draw a clear picture of the relationship between these two variables.

### *Adolescent Mothers' Self-Esteem*

Adolescent mothers' self-esteem has been the focus of somewhat more research than older mothers' self-esteem. What results there are indicate adolescent mothers' self-esteem trends differ somewhat from that of older mothers. Shapiro and Mangelsdorf (1994) found that adolescent mothers are similar to older mothers in that support from the baby's father is associated with higher self-esteem. However, unlike older mothers, support from the family of origin is not significantly related to self-esteem. Adolescents are at a point in their lives where they are working to differentiate themselves from their family of origin, and generally base their self-esteem on the success of extra-familial relationships rather than intra-familial relationships (Shapiro and Mangelsdorf, 1994). This theoretical basis for understanding why adolescent mothers' self-esteem is supported by the baby's father but not by the mother's family of origin is supported by research that indicates that adolescent mothers' patterns in self-esteem are similar to non-parenting adolescents (Hurlbut et al., 1997). That is to say, they base their self-esteem on extra-

familial relationships and their global self-esteem remains constant or rises slightly over time.

The adolescent focus on the formation of appropriate extra-familial, adult, intimate relationships necessitates both individuation from the adolescent's family of origin and building and maintaining close relationships with people outside the family. Researchers have found that the process of becoming a mother may complicate the development of appropriate intimate relationships (Hurlbut et al., 1997). Among other things, this complication may be problematic for the development of a strong self-esteem among young mothers. Additionally, mothers who are not yet developmentally able to form intimate relationships may encounter difficulties engaging appropriately with their children (Flanagan, McGrath, Meyer, & Garcia Coll, 1995).

Trends for adolescent mothers' self-esteem are important for at least two reasons. First, adolescent mothers' parenting skills are significantly related to their self-esteem (Hubbs-Tait et al., 1994; Hurlbut et al., 1997; Shapiro & Mangelsdorf, 1994; Unger & Wandersman, 1985) and, second, adolescent mothers' self-esteem is significantly related to their preschool children's ability to make friends among their peers (Hubbs-Tait et al., 1994).

***Self-esteem and Maternal Infant Feeding Choices***

As with maternal self-concept, the potential relationship between maternal self-esteem and breastfeeding rates has not been explored. However, for much the same reasons as maternal self-concept may be related to infant feeding intentions, actions, and choices, maternal self-esteem may be similarly important. Most importantly, may

experience a lowered self-esteem if they believe that breastfeeding is very important for their child's development, but feel they are unable to breastfeed. If this situation results in a lowered self-esteem, adolescent mothers may be at a particularly high risk for experiencing a decreased self-esteem, because they tend to breastfeed for a far shorter duration than older mothers and because their self-esteem is more transient than older mothers.

**Intimacy**

Intimacy is the psychosocial ability to form, maintain, and terminate close relationships with another person, or to share oneself appropriately with another person. Intimate relationships can encompass friendship, romantic relationships, and a variety of other kinds of relationship, including the parent-child relationship (Harach & Kuczynski, 2005). Erikson (1968) argues that these abilities are able to develop only after the adolescent identity crisis has been appropriately resolved. Adolescence and post-adolescence brings dramatic increases in social competence, including the ability to empathize and view situations from another person's perspective, that instigate a transformation of the adolescent's intimate relationships from those of a child to those of an adult (Beardslee, Schultz, & Selman, 1987).

Intimacy is a particularly important area for discussion in regard to motherhood because the role of mother necessitates engaging in the highly intimate mother/child relationship (Harach & Kuczynski, 2005). The advent of motherhood also often brings changes in the mother's intimate relationship with the child's father, including decreased sexual activity and a lower quality of communication (Ahlborg, Dahlof, and Hallberg,

2005). Motherhood demands adult forms of intimate relationships with the child and with the child's father while adolescent mothers may not be prepared to meet those demands.

Research has shown that adolescents' parenting skills are related to their psychosocial development, which includes their ability to be intimately engaged with their children (Flanagan et al, 1995). The adolescent mother's ability to be intimate with her baby is particularly important to her breastfeeding choices because of the intense physical and emotional mother/child intimacy that breastfeeding requires. Adolescents may not be developmentally prepared to develop that depth of intimacy with their children because they are still addressing other challenges, such as autonomy and identity formation.

***Crisis and Attachment***

Erikson (1968) discusses intimacy as a developmental stage that often comes to the fore just after adolescence, as an experience of a crisis of intimacy versus isolation. Successfully navigating this stage means gaining skills in maintaining the identity gained through the previous stage while relating deeply with a friend or a lover. Young adults processing this crisis become more skilled at building, maintaining, and possibly ending such a relationship. Another framework for understanding intimacy is the infant attachment theory, pioneered by John Bowlby and Mary Ainsworth (Karen, 1994). Infant attachment refers to the strength and quality of the parent-infant bond. There are three forms of attachment: secure, avoidant, and ambivalent. Avoidant and ambivalent attachment are sometimes referred to together as insecure attachment. A securely

attached mother is warm and responsive to her baby's cues and cries. A securely attached baby explores her environment and is comforted by her mother's presence (Karen, 1994). Both Erikson's and Bowlby's approaches have light to shed on the process of adolescent mothers' development of the ability to create and maintain intimate relationships, particularly with their children.

***Erik Erikson and Crisis Theory***

According to Erikson, adolescent mothers may have difficulty entering into the deeply intimate relationship that a mother optimally forms with her infant. This is because adolescents have not yet resolved their identity crisis, which leaves them without the sense of self required to engage meaningfully with another individual. There has been some research supporting this inference. Hurlbut et al. (1997) found that adolescent mothers who had a more positive role identity had higher self-esteem and were able to enter into more appropriate mother-infant relationships than mothers who had negative maternal role identities. These findings may support Erikson's theory that true intimacy cannot be well formed until the adolescent crisis of identity has been successfully resolved. They may also be seen as further evidence that adolescent self-esteem comes primarily from extra-familial relationships, which adolescents who had a well-formed identity were able to form more effectively. There are further implications for adolescent mothers in these results, because there are significant benefits for both a mother and child when the mother has a stronger self-esteem (Hubbs-Tait et al, 1994; Hurlbut et al, 1997; Shapiro & Mangelsdorf, 1994; Unger & Wandersman, 1985). Therefore, it may be particularly important for a young woman to have successfully navigated her way

through her identity crisis before having children. A discussion of Bowlby's theory of attachment will provide more depth in terms of the implications of a mother's developmental difficulty in forming an intimate, securely attached relationship.

***John Bowlby and Attachment Theory***

The basis of attachment theory is that intimate bonds are of the utmost importance for optimal human functioning and flourishing (Bowlby, 1982). Attachment theorists posit that, while separation and individuation are important processes of adolescent and adult development and functioning, the need for attachment continues throughout the entire lifespan and an individual's original attachment style continues to influence individuals for the rest of their lives (Ainsworth, 1989; Bowlby, 1982). Some theorists suggest that learning to balance the sometimes conflicting needs of separation and attachment is the primary challenge of adolescence (Grotevant & Cooper, 1986). Schwartz, McRoy, and Downs (2004) found that this process can be confounded when adolescents are also mothers. A majority of the young mothers in this study had insecure or non-existent relationships with their children, their parents, and their boyfriends. Attachment theorists posit that all mothers, regardless of their age, base their relationship patterns on the type of relationships they had with their first caregivers (Karen, 1994). Bornstein (2002) suggests that the nature of the adolescent mother's attachment to her own caregiver continues to affect her individually, her parenting, her relationships with adults, and her relationship with her baby.

When taken together, Erikson's and Bowlby's frameworks for adolescent development of attachment and intimacy do not provide an optimistic outlook on the

prospects for the psychosocial lives of adolescent mothers and their children. Adolescents, according to both Erikson and attachment theorists, are at a critical point in developing their ability to create emotionally healthy intimate bonds with other people. Being thrust into the emotionally demanding and highly intimate role of mother increases the difficulty of what is already a psychologically challenging process.

The role that breastfeeding plays in the intimacy development of adolescent mothers has not been investigated in any way. It may be that entering into a breastfeeding relationship forces an adolescent mother into such a highly intimate relationship that she is simply forced to engage in that way. On the other hand, it may be that it is because adolescent mothers are not psychologically prepared for such a relationship that they breastfeed as such lower rates than older mothers.

Adolescent mothers' relationships are made even more complex because of the gender and sexuality issues that arise when adolescence and motherhood meet. Indeed, the bonds connecting adolescent mothers with their children and their boyfriends are intricately woven with social, political, and emotional beliefs and reactions to gender and sexuality.

***Gender Roles and Sexuality***

Attachment theory suggests a highly integrated relationship between attachment style, gender, and sexuality. Research has indicated that insecure boys tend to be aggressive and angry, while insecure girls tend to smile a lot and be overly compliant (Turner, 1991). These trends for insecure children might be seen in the ways insecure adolescents relate to romantic partners sexually. Adolescent girls with insecure

attachment styles may be more likely to engage in sexual activity without condoms (Feeney, Peterson, Gallois, & Terry, 2000) and engage in sexual behavior as a way to feel more securely attached in a romantic relationship (Pistole, 1999). Adolescents who become mothers are more likely to have insecure attachments to their parents, and given the intergenerational transmission of attachment styles, are thus likely to pass on their insecurity to their children (Schwartz et al., 2004).

These issues are particularly important to the issue of breastfeeding because adolescent girls who may be the most likely to become mothers are the very ones who have difficulties with matters surrounding sex, sexuality, and relationships. This may have negative repercussions for breastfeeding rates among adolescent mothers. Particularly relevant is that, while research has not directly addressed adolescents' beliefs about the use and purpose of breasts, it is clear from the research with adolescents and breastfeeding that many adolescents attach a sexual meaning to the breasts, and thus consider breastfeeding to be inappropriate to be done in public or in the presence of men (Benson, 1996; Ellis, 1983; Forrester, Wheelock, & Warren, 1997; Gregg, 1989; Wolinski, 1989).

***Gender Role Development***

Who an adolescent wants to be is often formed in response to societal expectations. There are few areas where societal expectations have more influence on teenage girls than in gender roles (Steinberg, 1999). Role theory proposes that gender roles are group norms and expectations about how a man or a woman should conduct him- or herself in certain situations (Coltrane, 1996; Heiss, 1981; LaRossa and Reitzes,

1993). Gender theory has identified four gender orientations: femininity, masculinity, androgyny, and undifferentiated (Bem, 1981). Typical feminine traits include sensitivity, nurturing others, and paying attention to physical appearances (Bem, 1981). Typical masculine trains include assertiveness, ambition, and independence (Bem, 1981). Androgynous individuals are highly feminine and highly masculine, and undifferentiated individuals are low in both femininity and masculinity (Bem, 1981). People of either gender can take on many aspects of the four orientations. However, research indicates that the pressure to adhere to appropriate gender roles intensifies during adolescence, and is particularly strong for girls to be predisposed towards femininity (Crouter, Manke, & McHale, 1995).

Buchholz & Gol (1986) found strong correlations between increased femininity and childbearing in adolescents. In support of this assertion, one research study found that adolescent mothers have positive beliefs about what it means to be a woman (Theriot, Pecoraro, & Ross-Reynolds, 1991). In this study, adolescent mothers held positive beliefs about womanhood in that being a woman meant being mature, responsible, and emotionally nurturing. While research has not explored the link between gender role beliefs and parenting efficacy, it may be beneficial for adolescent mothers to consider women to possess these traits and to work towards them personally in their path to adulthood.

There may be some relationship between breastfeeding rates and gender role orientation, although it is not clear what this relationship may be. One study indicated that, for women in Brazil, mothers' infant feeding intentions were related to their gender

role orientations (Paine and Dorea, 2001). Interestingly, the mothers in this study with the most feminine and the most masculine gender role orientations were the most likely to plan to breastfeed, while androgynous women were the least likely. However, the authors of the study point out that Brazilian women are currently much more similar to American women in the 1960's than they are to modern American women. Therefore, it may be that there is a different relationship between gender role orientation for American mothers, and yet another relationship for adolescent mothers.

In addition to supporting positive gender role orientations and possibly being related to breastfeeding intentions, the tendency for adolescent girls to lean towards femininity can be problematic in sexual and romantic relationships (Crouter et al., 1995; Davies et al., 2004). By succumbing to the assumption that they will be nurturing and will not be assertive, adolescent girls may be at a high risk of being pressured into sexual behavior they do not feel comfortable with and into not using contraception (Jacobs, 1994). Therefore, adolescent internalization of gender roles is integral to a deeper understanding of adolescents' sometimes contradictory beliefs and attitudes about sexuality and contraception.

***Beliefs and Attitudes about Sexuality***

The majority of research on adolescents and beliefs about sex and sexuality has focused on contraception use. There is regrettably limited research that goes beyond contraception use to study adolescents' beliefs about sexuality. Studies have shown that adolescent girls begin to formulate their beliefs about sex and contraception, and to engage in sexual activities, at a surprisingly young age. The youngest of these girls are

often poor, with few socioeconomic or educational benefits. Brumberg (1997) suggested that because these young women have so few resources, they have much higher needs for nurturing and protection. She further said "in this environment, the body is often the only capital a girl will ever have" (p. 205). Brumberg is implying that young women use their bodies sexually as a way to gain favor and devotion. In addition, adolescent mothers in Jones-Harris' (1998) research revealed that they wished they had waited longer before becoming sexually active, that sexual intercourse is appropriate for adolescents, and that once a person started having sexual intercourse they needed to continue.

Through exploring the issue of contraception, it has become clear that adolescents tend to have a myriad of problems with condoms and other forms of contraception—from lacking knowledge and/or access to contraception to failing to use it to not using it properly. In a study by Davies et al. (2001), the adolescent mothers provided a number of reasons why they had not used contraception, including concern about and physical discomfort resulting from the hormonal effects of the pill and contraceptive shots, and fear that barrier contraceptives might cause medical complications, cause yeast infections, or reduce the pleasure from sexual activity. The young women in this study were very knowledgeable about contraception, the benefits it provides, and the correct way to use various forms of birth control, but often made the decision not to use it anyway. Adolescent mothers may be at an even higher risk than non-mother adolescents for inappropriate contraceptive use. These young women are more likely to have engaged in sexual activity without a condom, to have had more than one sexual partner, and to have experienced physical or sexual abuse (Koniak-Griffin & Lesser, 1996;

Lourie, Brown, Flanagan, High, Kumar, & Davis, 1998) when compared to adolescent non-mothers.

Unfortunately, little of the research that has focused on adolescent mothers has addressed their response to pregnancies beyond the first one. As a result, little is known about adolescent mothers' views or beliefs about abortion or the so-called morning after pill. This research has focused primarily, and perhaps exclusively, on pregnant adolescents with no children (for examples, see Beson, 2004 and Hope, Wilder, and Watt, 2003).

Research has shown that preventing pregnancy or sexually transmitted diseases may not be adolescents' primary concern when considering the use of contraception (Davies et al., 2001). Rather, adolescents may use contraception as a way of testing their partner's commitment to their relationship (Davies et al., 2001). Researchers have encountered this belief when asking adolescents about their contraceptive choices. Some adolescents say that if their sexual partner insists on using contraception, they must be sexually involved with another person or looking to be sexually involved with another person (Davies et al., 2001; Koniak-Griffin et al., 2003; Lamanna, 1999; Nathanson, 1991).

***Psychological Development of Adolescent Mothers***

An adolescent mother has a harder task of parenting than an older mother. She is attending to the significant psychologically demanding tasks of both puberty and parenting at the same time. Both of these developmental tasks bring substantial shifts in hormones that influence body shape and weight and can induce mood swings. Both of

these tasks require that the mother reformulate her identity and her involvement in intimate relationships, both physical and emotional. In addition to these deeply personal changes, an adolescent mother may have significant difficulties navigating the day-to-day practical aspects of parenting. She is more likely to be single, to have closely spaced births, to be poor, to have been abused, to be abusive, to be insecurely attached to her own caregivers, and to cultivate insecure attachment styles in her children. With all of these changes and demands converging on one individual at one time, adolescent motherhood could be considered something of a "perfect storm."

Given that there are so many factors pulling for an adolescent mothers' limited resources, it may be relevant to ask whether breastfeeding would attend to enough of those needs to off-set the negative aspects of breastfeeding. Specifically, do the benefits enumerated at the beginning of this discussion balance the increased physical and emotional demands on an already thinly stretched adolescent mother?

However, regardless of an adolescent mother's breastfeeding choice, and even in this perfect storm of demands on young mothers, adolescent mothers, like older mothers, give evidence of a range of parenting skills and abilities (Shapiro & Mangelsdorf, 1994). Indeed, adolescent mothers have consistently shown that their competence and expertise vary dramatically within group. One researcher has gone so far as to suggest that combining such a wide range of knowledge and skills into the one category of "Teen Mother" potentially renders that term so difficult to define as to make it meaningless (Raeff, 1996). Thus, future research must account for the within-group variability in

parenting among teenage mothers in order to understand why some adolescent mothers do well while others do not.

However, the vast majority of research on adolescent parents accentuates the negative effects that giving birth at a young age has on a young woman and her off-spring in the short term and for the rest of their lives. It is also important to understand the positive sides of teen parenting. For example, for some young women becoming mothers indicates an increase in family status (Dunston et al, 1987), induces them to take on a valued social role (Bucholz & Gol, 1986), and produces a stabilizing and positive influence in their lives (Davies et al, 2001; Jacobs, 1994). These effects have not been widely researched or thoroughly incorporated into theory about adolescent parents. Nor has the role that breastfeeding may play been incorporated into the discussion of these possible benefits. Perhaps the potentially positive effects of adolescent motherhood have been largely undiscussed is because it is difficult for adult researchers to critically examine adolescent sexuality in a positive light (Nathanson, 1991; Luker, 1996). Perhaps it is because the majority of research with adolescent mothers has compared these young mothers to adult mothers, assuming they are comparable. Adolescent mothers are addressing a host of social, emotional, and psychological issues that, by and large, do not affect adult mothers. Research with adolescent mothers may be better served, then, by viewing these young mothers as separate and distinct from their older counterparts.

For example, Davies et al. (2001) argue that adolescent mothers are often very engaged in their pregnancies and birth experiences, actively choosing to create a family, regardless of whether they actively chose the pregnancy or not. These researchers create

a picture of the young mothers who participated in their qualitative research project as thoughtful, active participants in their pregnancies, who worked to create appropriate support networks for themselves and their children. Davis (2004) brought together a series of personal essays that echoes this sentiment. In her book, adolescent mothers wrote about how pleased they were to be young and have the energy to keep up with their small children. They described their early parenting experiences as painful, all-consuming, educating, lifesaving, enlightening, and full of love and laughter. It would be a rare older mother who would not echo these sentiments.

Regardless of the good qualities that adolescent parents can, and often do, possess, adolescent motherhood is described almost universally in negative terms. Some feminist writers have suggested this negative outlook is due, at least partly, to adult researchers' discomfort with adolescent sexuality—a prerequisite for adolescent motherhood (Davies et al., 2001). Furthermore, even though feminist theorists and advocates have taken the lead in furthering the rights and correcting stereotypes about mothers and motherhood, feminist theorists have generally remained silent on the issue of adolescent motherhood. It has been suggested that many feminists have ignored the issue of adolescent motherhood because they, too, are uncomfortable with the issue of adolescent sexuality and childbearing (Nathanson, 1991; Luker, 1996). However, young mothers may need a reconceptualization and more sensitive appreciation of their roles and abilities more than any other group of mothers. In order to create a responsive, socially progressive vision of the family, the good and the bad of young mothers' lives, parenting skills, and psychological development must be taken into consideration.

Nevertheless, regardless of the many open, loving, and securely attached adolescent mother-child pairs, the majority of the research on adolescent mothers uses a deficit model of analysis. Much of the literature reviewed here, unfortunately, has reflected that bias.

## Breastfeeding

### Introduction

There is evidence that breastfeeding serves mothers, babies, families, and society in many ways, including providing economic, immunologic, developmental, psychological, social, and environmental benefits (Gartner and Black, 1997). For example, mothers who breastfeed their babies have been shown to be more attached and less abusive than mothers who don't breastfeed (Klaus, 1998). This finding is supported by research that shows breastfeeding initiates the release of oxytocin in the mother, which activates maternal behavior and bonding between mother and baby (Matthlesen, Ransjo-Arvidson, Nissen, and Uvnas-Moberg, 2001; Uvnas-Moberg and Eriksson, 1996).

Adolescent mothers may be at a particularly high risk for many of the issues that breastfeeding may help protect against (Wambach and Cole, 2000). Adolescent parents are more likely than older parents to live in poverty (Roditti, 1997). Research has indicated that both adolescent mothers and their children may have more difficulties in socio-emotional development than either non-parenting adolescents or children of older parents (Hubbs-Tait et al, 1994; Ketterlinus et al, 1991). There is evidence that adolescent mothers are more likely to be abusive and less likely to be securely attached to

their children than women who are older at the time of their first birth (Flanagan et al, 1995; Spieker and Bensley, 1994). Therefore, adolescent mothers, their children, and society may have something to gain from increased breastfeeding rates, and a first step may be a better understanding of this practice in adolescent mothers.

**Demographic Correlates with Breastfeeding**

There are a variety of demographic variables that are associated with infant feeding choices in older mothers. Maternal age, maternal marital status, maternal educational attainment, household income, WIC enrollment, race/ethnicity, having previous children, birth hospital, and the child's admittance into the Neonatal Infant Care Unit (NICU) are all correlated with differential maternal infant feeding choices among older mothers (Bernaix, Schmidt, Jamerson, Seiter, & Smith, 2006; Hurst & Meier, 2005; Kruse, Denk, Feldman-Winter, & Rotondo, 2005; Li et al., 2005; Meier, 2001; Meier, Brown, Hurst, Spatz, Engstrom, & Borucki, 2000). However, the researchers who have investigated these relationships did not identify how the variables may be associated with maternal infant feeding choices for adolescent mothers. Because of the very different psychological developmental trajectories of adolescent mothers when compared with older mothers, it may be that demographic variables are differentially correlated with adolescent mothers' infant feeding choices. Further potentially relevant variables, including the total number of siblings and the birth method have not been studied in terms of their relationship with maternal infant feeding choices for mothers of any age.

***Maternal Age***

It has long been understood that adolescent mothers breastfeed less often than older mothers (White, Freeth, and O'Brien, 1993). Although it is clear that this is the case currently (Li et al, 2005), historical trends in adolescent mothers' infant feeding practices are not typically discussed or published. In addition to the dearth of historical data, there is little known about potential differences in breastfeeding trends within the adolescent population, particularly according to age.

Very young adolescents (i.e., 11 – 14 years old) generally have not progressed as far in their psychological development as older adolescents (18 – 19). It may be that the psychological development that often occurs during middle adolescence enables adolescent mothers to engage in the intimacy of the breastfeeding relationship more readily. Therefore, the difference in psychological development between younger and older adolescents may be able to be seen through the infant feeding decisions. For example, it may be that older adolescents are more similar to their older counterparts, and so breastfeed more often and for a longer time. On the other hand, there may be very little difference in breastfeeding rates within the adolescent population because the group of adolescents who are more likely to become pregnant may have a lower average psychological development than adolescents who do not become pregnant. While it may be that motherhood changes the psychological developmental trajectory for adolescents, the infant feeding choice is made when the adolescent has just become a mother, and so her developmental trajectory may not yet have been altered by motherhood.

***Maternal Marital Status***

Recent analysis of adult mothers' infant feeding practices indicate that being married is significantly correlated with increased breastfeeding initiation and duration (Li et al, 2005). It may be that a married mother is more likely than a non-married mother to have another adult in the house who is able and willing to support her in building and maintaining a breastfeeding relationship with her baby. It may be that a similar effect occurs for adolescent mothers. However, there has been no research investigating the effects of marriage on adolescent mothers' breastfeeding rates. On the other hand, it may be that adolescent mothers are more likely than older mothers to live with adults to whom they are not married, and so the effect of being married may not be as significant for adolescent mothers' breastfeeding practices.

***Maternal Educational Attainment***

Higher levels of education have a strong relationship with a mother's choice to breastfeed her infant (Callen and Pinelli, 2004). A college degree, in particular, has the strongest relationship with substantially increased breastfeeding initiation and duration (Li et al, 2005). The relationship between maternal educational attainment and maternal infant feeding choices has changed over time. In the mid-1950's to the mid-1960's, bottle feeding was often the infant feeding method chosen by the highly educated, and formula was considered as beneficial to babies as breastfeeding (Knaak, 2005). More recently, however, the beliefs about the quality of formula and breast milk have changed. Breastfeeding rates in the mid-1970's were stratified such that mothers with lower levels of education breastfed far less than mothers with higher levels of education. Since that

time, breastfeeding initiation rates have been steadily increasing across all educational levels, although it may be that breastfeeding duration rates have been simultaneously decreasing (CDC, 1998). Nevertheless, breastfeeding has been the infant-feeding method of choice among the highly educated for the past four decades (Callen and Pinelli, 2004).

However, the 2001 NIS data indicate some interesting statistical differences among the very low levels of educational attainment (Li et al, 2005). Mothers with a high school diploma have statistically significantly lower levels of breastfeeding than mothers who do not have high school diplomas and than mothers who have some college education (Li et al, 2005). Whether this unusual difference is primarily because of adolescent mothers or older mothers with low educational attainment levels is unclear. Looking at only the adolescent mother population's educational attainment and breastfeeding rates may begin to shed some light on the issue.

***Household Income and WIC Enrollment***

An international meta-analysis of breastfeeding rates indicates that income level is consistently negatively correlated with the maternal choice to breastfeed, both in the United States and abroad (Callen and Pinelli, 2004). However, the United States has a much lower breastfeeding rate among mothers with the lowest income levels when compared to other countries (Callen and Pinelli, 2004). The researchers theorize this trend might be due to the United States' policy of providing free infant formula to poor mothers through WIC, given that the United States is the only country included in the reviewed studies to have such a program. This theory is supported by research with data from the 2001 National Immunization Survey (NIS) data (Li et al, 2005). The data

presented include the fact that children who were enrolled in WIC had much lower breastfeeding rates when compared with children who were not eligible for WIC. However, children who were eligible, but not enrolled, in WIC had higher breastfeeding rates than either of the other two groups. While the authors did not choose to comment on this point, it is suggestive of WIC enrollment reducing breastfeeding rates, beyond the impact of income.

The relationship between household income and maternal infant feeding choice has been clearly demonstrated among older mothers (Callen and Pinelli, 2994). That household income is positively related to breastfeeding rates has become something of a truism among researchers. However, there has been no discussion of the potential relationship between household income and adolescent mothers' infant feeding choices. Within the adolescent mother population, it may be that household income and breastfeeding rates are not so clearly associated. Particularly, there are two important issues for this population that may reduce the correlation: (1) a severely restricted range of household income and (2) the household income may not be primarily determined by the baby's mother or father, which could decrease its importance.

***Race/Ethnicity***

Research indicates that ethnicity and culture impacts parenting in a variety of ways (Keller, Lamm, Abels, Yovsi, Borke, Jensen, Papaligoura, Holub, Lo, Tomiyama, Su, Wang, & Chaudhary 2006). The influence may extend to maternal infant feeding choice. One study suggests that, in the United States, Asian mothers are the most likely to breastfeed exclusively at discharge from the hospital, followed by Anglo mothers, with

African-American and Hispanic mothers breastfeeding the least (Kruse, Denk, Feldman-Winter, and Rotondo, 2005). Another study suggested that Hispanic mothers breastfeed the most often, followed by Asian and Anglo mothers, with African-American mothers breastfeeding the least (Li et al., 2005). While both of these trends in differences between ethnic groups and breastfeeding rates are cited by various researchers, some research has even suggested that there are no differences in infant feeding choices across ethnic groups (Else-Quest, Hyde, and Clark, 2003). The outcome variance in these studies may be indicated by variables not explicitly spelled out, including immigrant status, maternal age, how the researchers defined increased levels of breastfeeding, etc. However, given the larger body of research that indicates an impact of race on infant feeding choice, some validity may be given to the theory that there may be a correlation between race/ethnicity and breastfeeding rates.

Even given the extensive and contradictory research on the issue of race/ethnicity and breastfeeding patterns, the impact relationship between race and adolescent mothers' infant feeding choices has been overlooked. Because of the very different psychological development of adolescent mothers when compared to older mothers, the same trends cannot be assumed to translate between groups. So while there may be a correlation between race and adolescent mothers' feeding choices, this is still an open question.

***Total Number of Siblings***

There is some evidence that children of older mothers are breastfed similarly regardless of whether they are the firstborn in the family or if they have siblings (Li et al, 2005). However, it may be that children born to adolescent mothers differ in this respect.

It may be that for adolescent mothers, increasing the number of children above one may negatively impact their ability to breastfeed more than it would for older mothers because parenting is generally more difficult for adolescent mothers. Another possibility is that adolescents who are more likely to get pregnant a second time may be less inclined to breastfeed either child.

The research analyzing the relationship between breastfeeding rates and numbers of children has grouped children into two categories: (1) firstborn and (2) not firstborn. Therefore, the relationship between exact numbers of children and maternal infant feeding choices has not been addressed with mothers of any age. However, it may be that additional children have a compounded effect on a mother's finite resources, and so mothers may tend to breastfeed less with each additional child. On the other hand, it may be that mothers who are inclined to have a large family are more inclined to breastfeed for ideological or religious reasons. For adolescent mothers, however, the first hypothesis may be more applicable.

***Birth Hospital***

Although it is clear that different hospitals have different breastfeeding rates, there has been only one study that investigated the relationship between birth hospital variables and breastfeeding rates (Kruse et al., 2005). This study described considerable differences between hospitals in breastfeeding rates. While maternal sociodemographic factors explained some of the between-hospital variance in breastfeeding rates, there was substantial variance that remained unexplained. This study used the hospital average breastfeeding rate at maternal check-out as the unit level of analysis, and so did not

investigate the potential long term relationship between birth hospital and breastfeeding duration. Nor did this study target the adolescent mother population specifically, primarily because of this study's focus on the hospital as the unit of analysis.

### *Birth Method*

There are several aspects of the birthing process that have been examined in terms of their relationship to breastfeeding trends, including giving birth to more than one child and a child's admittance to the NICU (Feldman-Winter, Kruse, Mulford, & Rotondo, 2002; Forste, Weiss, & Lippincott, 2001; Ryan, Wenjun, & Acosta, 2002). However, the relationship between birth method (i.e., cesarean section or vaginal) and breastfeeding rates for individual mothers has not been examined. There is some evidence that hospitals with high cesarean rates have low breastfeeding rates (Berens, 2001). However, this relationship has not been examined on the individual level, so it is unclear, for example, whether birth method may be related to breastfeeding trends for adolescent mothers.

### *Child's Admittance to the NICU*

Previous research has been very clear about the relationship between a baby's admittance into the NICU and decreased breastfeeding initiation duration as compared with non-NICU babies for older mothers (Bernaix et al., 2006; Hurst & Meier, 2005; Meier et al., 2000). Researchers have attributed this relationship to a number of factors particular to the NICU environment, including maternal exhaustion, anxiety, stress, and concern about the infant; lack of confidence in establishing and maintaining a milk

supply; no access to a breast pump; and minimal privacy in the NICU (Meier, 2001; Merewood, Philipp, Chawla, & Cimo, 2003; Nyqvist, Sjoden, & Ewald, 1994; Woolridge & Hall, 2002). However, the reaction of adolescent mothers to the NICU environment has not been investigated in any of the previous literature.

## Reasons Supporting Adolescent Mothers' Breastfeeding Practices

Adolescents breastfeed their babies far less often, for shorter periods of time, and with more formula supplementation than older mothers (Li et al, 2005). This is particularly relevant because of the supportive nature of breastfeeding, specifically in areas where adolescent mothers are at the most risk. Because of the impact breastfeeding may have on adolescent mothers and their children, it is important to investigate the reasons why adolescents choose breastfeeding or formula. In one research study, adolescent mothers who choose to breastfeed more often gave infant-oriented reasons for their feeding choices while adolescent mothers who choose to formula feed gave more self-oriented reasons (Yoos, 1985). The ways that researchers have categorized the reasons for adolescent mothers' infant feeding decisions varies between researchers, but probably the most straightforward method is by topic.

### *Baby's Health*

While some adolescent mothers make choices based on the psychosocial factors that influence their non-parenting peers, others make choices that are more child-focused. Older mothers may be more likely than adolescent mothers to choose to breastfeed based

on the health impacts on her baby, although health influences remain a factor in adolescent mothers' decision to breastfeed (Wambach & Cole, 2000).

***Mother-Infant Attachment***

As with the positive influences of breastfeeding on babies' physical health, the decision to breastfeed based on a perceived resulting increase in the mother-infant bond is a very child-centered approach to feeding choice. Adolescent and older mothers who decide to initiate breastfeeding often base this decision on the belief that it will increase the quality and strength of the mother-infant bond (Maehr et al, 1993).

***Body Image***

Body image is a particularly relevant issue for adolescent mothers because of the physical changes that they are encountering due to puberty (Steinberg, 1999). When these normal adolescent changes occur in addition to the physical changes that pregnancy brings, adolescent mothers may feel even more insecure and protective of their bodies. The added pressure on an adolescent of learning how to use her breasts to nurture a baby as she is acclimating herself to the sexual implications of her breasts may be overwhelming for some new mothers.

This theory may be supported by the finding that breastfeeding is considered by some adolescents to be an embarrassing act that should be done in private, or at least away from men (Benson, 1996; Ellis, 1983; Forrester, Wheelock, & Warren, 1997; Gregg, 1989; Wolinski, 1989). Some adolescents have suggested that breastfeeding will make it more difficult for the mother to lose her baby weight (even though breastfeeding

actually makes it easier to lose pregnancy weight) and will make her breasts unattractive (Radius and Joffe, 1988). The fact that adolescents hold these beliefs about breastfeeding is suggestive of prevailing societal pressures on both younger and older mothers to feed their infants formula (Wambach and Cole, 2000). Young mothers' beliefs and concerns about her body image when considering whether to breastfeed are generally born out of popular images in a culture (Wambach and Cole, 2000).

***Work/School***

Some adolescent mothers feel that when they return to work and/or school they should not or will not breastfeed their babies. For example, adolescent mothers who began by breastfeeding their infants may view this as a good time to wean the infant (Gaff-Smith, 2004; Ineichen, Pierce, & Laurenson, 1997). It is uncommon for adolescent mothers to specifically mention the need to return to work or school as a reason for not breastfeeding their babies (Wambach and Cole, 2000). However, adolescent mothers' desire for other adults to be able to feed their babies is a common reason for choosing formula (Wambach and Cole, 2000).

***Social/Cultural Influences***

Many of the reasons cited by adolescents for their infant feeding choices, and described above, are suggestive of the influence that culture has on young mothers' decisions. This may not be surprising, as investigating a sense of self within a social context and developing intimacy outside of the family of origin are processes that are common stages of adolescent psychosocial development in our society. The process of

becoming a mother does not necessarily alter adolescent mothers' developmental tracks such that they do not in some way respond to these societal tendencies. It may be, then, that adolescent mothers often make their infant feeding decision with the social context as the primary influence. Adolescent mothers are more likely to make the choice to breastfeed based on friends or family than are older mothers (Wambach, 2000). Adolescent mothers who know breastfeeding mothers, who have a role model who breastfed their baby, who were breastfed themselves, and whose culture has higher breastfeeding rates are more likely to initiate breastfeeding (Wiemann, DuBois, & Berenson, 1998a; Wiemann, DuBois,, & Berenson, 1998b)

However, the general culture does not support adolescent mothers in making the decision to breastfeed. A literature review of books that address adolescent mothering shows that the discussion of breastfeeding in information created for this population is severely lacking. A majority of books discussing adolescent mothering did not mention infant feeding practices at all (Whitman, Borkowski, Keogh and Weed, 2001; Luker, 1996; Maynard, 1997), including books written for adolescent mothers themselves (Arnoldi, 1998; Bode, 1980). One book suggested that it is inappropriate for adolescents to breastfeed, given the other demands in their lives (Musick, 1993). Only one book addressing adolescent motherhood discussed the ways adolescent mothers can benefit from breastfeeding their infants (Hudson, 1991).

This trend in literature to ignore breastfeeding in adolescent mothers is very different from the way books address feeding choices when discussing older mothers. There is substantial support in the vast majority of books about mothering for

breastfeeding. Even theorists who argue that increased separation between mothers and babies can be supportive of mothering still encourage breastfeeding because of the indisputable physical benefits it provides over formula (Eyer, 1992, 1996). But it is an absolute rule that books written about and for adult mothers talk about infant feeding and breastfeeding in particular. (Knaak, 2005). That books about and for adolescent mothers are so different in this regard suggests that adolescent mothers who decide to breastfeed, and who do not come from a particularly breastfeeding positive family, may have a hard time finding support for their decision. Although it has not been previously investigated, it may be that because of the differential cultural support for breastfeeding, adolescent mothers from different racial/ethnic backgrounds make their infant feeding decisions based on different reasons.

**Conclusion**

While the reasons that adolescent mothers give for their infant feeding choices are interesting, previous research has not attempted to connect these reasons to either maternal infant feeding behaviors or maternal sociodemographic variables. For instance, it may be that adolescent mothers whose racial/ethnic backgrounds are more likely to breastfeed give different kinds of reasons for their feeding choices than mothers who come from breastfeeding unfriendly backgrounds. It may also be interesting to note whether the reasons an adolescent mother gives for her infant feeding choices is related to her actual infant feeding behavior at a given point in time.

**Statement of the Problem**

Adolescent motherhood brings dramatic shifts in psychosocial development away from both the traditionally assumed adolescent trajectory and the standard transitions that adult mothers experience. These variations can make understanding or influencing adolescent mothers' decisions particularly problematic. In the case of maternal infant feeding decisions, adolescent mothers generally decide to feed their babies formula, even given the many benefits associated with breastfeeding. In order to begin to understand or influence adolescent mothers' infant feeding decisions in order for more mothers and children to reap the benefits associated with breastfeeding, researchers must know what decisions adolescent mothers are making. This will allow them to assess the efficacy of any interventions, as well as provide a basis for asking probing questions to more fully understand the underlying elements in their decision-making processes.

In this dissertation I will endeavor to describe adolescent mothers' infant feeding decisions and how they vary according to a variety of demographic variables.

I hypothesize that adolescent mothers will breastfeed their children less often than older mothers. This finding has been well documented in previous studies. I also expect that younger adolescent mothers breastfeed at a lower initiation and duration than older adolescent mothers. I expect this to be the case because older adolescents will have already addressed the dramatic psychological shifts that occur during adolescence, and so will be more similar to adult mothers in their parenting choices.

I expect for maternal marital status to be similarly correlated with breastfeeding practices in adolescent mothers as they are for older mothers. That is, I expect that

married adolescent mothers will have increased levels of support in the form of their husbands to allow them to breastfeed at increased rates when compared to non-married adolescent mothers.

It is somewhat unclear how breastfeeding rates will correlate with maternal educational attainment for the adolescent mother population because the literature indicates it may have a non-linear impact on breastfeeding initiation and duration on the lower end of the educational spectrum. Specifically, the only study which presents data on maternal educational achievement indicates that breastfeeding initiation levels go from highest to lowest in the following order: college degree, some college, no high school diploma, a high school degree or equivalency. The potentially non-linear nature of this relationship makes it a particularly interesting one to investigate within the adolescent mother population.

The potential relationship between adolescent mothers' breastfeeding rates and their household income is particularly hard to hypothesize about. While previous research has suggested the positive correlation between older mothers' breastfeeding rates and their household income, there is good reason to think that an increased household income will correlate with adolescent mothers' decisions differently than it does with older mothers. Specifically, adolescent mothers may have a restricted range of income, and may not be part of the primary income-earning strata in their households. These additional variables may have the effect of neutralizing the positive correlation between household income and breastfeeding rates that is so often discussed with older mothers.

While the previous literature is in some conflict in regards to the correlation between race/ethnicity and breastfeeding rates, I find that the studies suggesting that among older mothers, a Hispanic background is positively correlated with breastfeeding rates and an African-American background is negatively correlated with breastfeeding rates, are the strongest in theory and methodology. I expect to find the same trend among adolescent mothers. However, I expect there to be an interaction between race and maternal age, with Hispanic adolescent mother breastfeeding at rates more normative to older Hispanic mothers, and all other races/ethnicities of adolescent mothers to breastfeed at rates far below that of older mothers of the same race/ethnicity. I expect this interaction because early childbearing is more accepted in the Hispanic culture than it is in other cultures. Therefore, I expect Hispanic adolescent mothers will have more social support and positive expectations of them than adolescent mothers from other cultures. I hypothesize that this will allow adolescent Hispanic mothers to breastfeed their babies more closely to the way older Hispanic mothers do when compared with the differences between adolescent mothers and older mothers from other cultures.

I expect to find that, contrary to research with older mothers, that adolescent mothers will tend to breastfeed their children less often if she or he is not the mother's firstborn. That is, I expect that adolescent mothers who are giving birth to their second or subsequent child will not be as able to meet the needs of all of her children as an older mother would, and that this will be indicated by reduced breastfeeding rates for non-firstborn children of adolescent mothers. Furthermore, I expect to find that as the

numbers of children an adolescent mother has increases, the likelihood that she will breastfeed them will decrease.

Previous research has indicated that maternal breastfeeding rates differ by hospital. However, because the mothers included in this study are within a restricted population, namely they are all adolescent mothers, they may have more similar breastfeeding rates within their group, even between hospitals. Therefore, I hypothesize that the adolescent mothers in this study will not differ in breastfeeding rates between hospitals.

Although hospital statistics indicate that hospitals with high cesarean section rates often have low breastfeeding rates, this relationship has not been documented either among individual mothers or with adolescent mothers. However, there are two strong supports for extending this correlation to individual adolescent mothers: (1) mothers who have gone through major surgery may not be able to engage in the demanding physical breastfeeding relationship and (2) it may be that mothers who are more likely to appreciate the maternal and infant benefits associated with a vaginal birth, and are willing to work for those benefits, are more knowledgeable about the benefits associated with breastfeeding and are willing to work to build a breastfeeding relationship. Therefore, I hypothesize that mothers who give birth vaginally are more likely to breastfeed when compared to mothers who have a cesarean section.

I expect to find that adolescent mothers breastfeed at decreased rates when their children are admitted to the Neonatal Infant Care Unit (NICU) because of the substantial research with older mothers. Most of the researchers who have investigated this

relationship among older mothers have suggested that decreased breastfeeding rates among NICU mothers are a result of the substantial stressors that the NICU places on parents, in addition to the added difficulty of pumping breast milk or nursing in the relatively public NICU environment. While it may be that adolescent mothers react to this situation differently than older mothers, there is no current evidence to support a difference.

My final analysis will be with the qualitative data. Because of the dearth of previous literature relating maternal infant feeding decision making with (1) various demographic variables and (2) actual infant feeding behaviors, it is unclear how these variables may or may not relate to each other.

# Chapter 2: Methods

This dissertation investigated the relationship between several demographic variables and adolescent mothers' infant feeding decisions and on the duration of breastfeeding. The demographic variables include the age of mother at the time of birth, the mother or the child's race/ethnicity, first-born status of the child, maternal educational attainment, maternal marital status, birth method, and birth hospital. This research uses two existing databases to analyze the breastfeeding tendencies of adolescent mothers. The first database draws on a national sample, and was collected by the Center for Disease Control. The second database includes mothers who birthed at five hospitals in a midsized, southwestern city and was collected by a local non-profit agency.

The Center for Disease Control dataset (CDC) was gathered in 2004 as part of the larger National Immunization Survey (NIS). The CDC used a random digit dialing telephone survey to contact families with children ages 19 to 35 months (i.e., children who were born in 2001 to 2003). The survey asked for a knowledgeable adult, preferably the child's guardian, to provide demographic information about the mother and the child and answer questions about vaccinations and breastfeeding that could be pertinent to assessing vaccination coverage and progress towards achieving the goals for increased childhood vaccinations set forward by the 1992 Childhood Immunization Initiative. Additionally, NIS contacted participants' healthcare providers to confirm vaccination records provided by the participating children's parents or guardians. The information used in this analysis will only include demographic and breastfeeding variables.

The non-profit agency's dataset (NP) was gathered from outreach parenting support provided to mothers who gave birth during 2005 and 2006 at five hospitals in a mid-sized southwestern city. Because the non-profit agency was not able to interview all of the mothers who gave birth at these hospitals, priority was given to poor, young, and first-time mothers. This led to the percentage of younger mothers in the NP sample being higher than it is in the general population.

## PARTICIPANTS

### Center for Disease Control

The CDC survey included children between the ages of 19 and 35 months living in the United States. NIS identified households containing children in the target age range using a random-digit-dialing telephone survey. An adult who was knowledgeable about the child was asked to provide information about the family's demographic information and the child's immunization and breastfeeding history. The adult may have been the mother, the father, or another adult living with the child. The survey included mothers of all ages. Some of the participants in this dataset may have missing data. Those participants will not be included in the analysis procedure.

### Non-Profit Agency

The NP gathered quantitative information from 7319 mothers in six hospitals in a mid-sized, southwestern city. Of these mothers, 1080 (14.8%) were between the ages of 11 and 19, and will be included in the quantitative analysis. The agency gathered

qualitative information on infant feeding choice from 50 of these teenage mothers, which will be analyzed separately.

## VARIABLES

### Center for Disease Control

The predictor variables from the NIS dataset that will be used in this analysis include the following:

| Predictors (X) | Variable Name | Label | Value |
|---|---|---|---|
| Mother's Age | M_AGEGRP | 1 | <=19 years |
| | | 2 | 20 - 29 years |
| | | 3 | 30+ years |
| Mother's Marital Status | MARITAL | 1 | wid/div/sep/deceased |
| | | 2 | never married |
| | | 3 | married |
| Mother's Educ Attainment | EDUC1 | 1 | <12 years |
| | | 2 | 12 years |
| | | 3 | >12 years, non coll grad |
| | | 4 | college graduate |
| WIC Benefits | WIC | 1 | yes |
| | | 0 | no |
| Income to Poverty Ratio | INCPORAT | cont. | MIN = 0.05 |
| | | | MAX = 3.00 |
| | | | MEAN= 2.09 |
| | | | MED = 2.41 |
| First Born Status | SIBLINGS | 0 | no siblings |
| | | 1 | has siblings |
| Child's race/ethnicity | RACEETHK | 1 | Hispanic |
| | | 2 | White |
| | | 3 | Black |
| | | 4 | Multiethnic |

Table 1: CDC Predictor Variables

The CDC calculates the income to poverty ratio from family income, number of persons living in the household, number of children living in the household, and the 2003 census poverty threshold.

The outcome variables from the NIS dataset that will be used in this analysis include the following:

| Predicted (Y) | Variable Name | Label | Value |
|---|---|---|---|
| Ever Fed Breast Milk | FED_BM | 0 | no |
| | | 1 | yes |
| Duration of Breast Milk | BF_ENDR | cont. | MIN = 0.0 |
| | | | MAX = 730.50 |
| | | | MEAN= 222.03 |
| | | | MED = 183.00 |

Table 2: CDC Predicted Variables

**Non-Profit Agency**

The participant response from the NP questions will be used in the quantitative analysis include the following:

| Predictors (X) | Variable Name | Label | Value |
|---|---|---|---|
| Mother's Age | C_MO_AGE | 1 | 11 – 14 years old |
| | | 2 | 15 – 17 years old |
| | | 3 | 18 – 19 years old |
| Number of Children | C_N_CHIL | 1 | 1 child |
| | | 2 | 2 children |
| | | 3 | 3+ children |
| Mother's Ethnicity | ETHNICIT | 1 | White |
| | | 2 | Hispanic |
| | | 3 | African American |
| | | 4 | Asian |
| | | 5 | Other |
| C-Section? | Csec | 1 | Yes |
| | | 2 | No |

Table 3: NP Predictor Variables

The outcome variables will be:

| Predicted (Y) | Variable Name | Label | Value |
|---|---|---|---|
| Feeding in Hospital | Feed_Hos | 0 | No Breast milk |
| | | 1 | Breast milk |
| Feeding @ 3 Days Post Partum | Feed_3day | 0 | No Breast milk |
| | | 1 | Breast milk |
| Feeding @ 3 Weeks Post Partum | Feed_3week | 0 | No Breast milk |
| | | 1 | Breast milk |
| Feeding @ 3 Months Post Partum | Feed_3mo | 0 | No Breast milk |
| | | 1 | Breast milk |

Table 4: NP Predicted Variables

The NP gathered qualitative information in order to provide a deeper analysis of feeding choices among adolescent mothers. The data were gathered at three weeks post-partum. Adolescent mothers who fed their babies formula were asked: "Why did you decide to feed your baby formula?" Adolescent mothers who fed their babies breast milk were asked: "Why did you decide to feed your baby breast milk?" Adolescent mothers who fed their babies a combination of formula and breast milk were asked: "Why did you decide to feed your baby formula and breast milk?"

## PROCEDURE

### Center for Disease Control

Interviews began on January 6th, 2004 and ended on March 10th, 2005. A total sample of 3.6 million telephone numbers were called and 30,987 interviews were completed. Of these children, 696 (2.2%) were born to mothers nineteen years or younger, 12,654 (40.8%) were born to mothers between 20 and 29 years old, and 17,637

(56.9%) were born to mothers 30 years or older. Exact age of mothers is not known; only that the mother was a teenager at time of birth. The percentage of adolescent mothers included in this sample is lower than the percentage of adolescent mothers in the United States population, which was 11% in 2001 (Martin et al, 2002). The racial make up of the sample was also different from the adolescent mother population in the United States, with Hispanic and African-American adolescent mothers overrepresented and Anglo and other adolescent mothers underrepresented.

**Non-Profit Agency**

The participants were approached by HIPPA-certified female employees and volunteers from the NP in the hospital one day after they had given birth. They were presented a binder with a wide range information, including baby care, home baby proofing suggestions, babies developmental milestones, breastfeeding tips, and WIC and Medicaid contact information. Participants were asked to provide some demographic information and feeding choices. The NP's representatives talked with the mother for as long as the mother was interested about her mothering experiences thus far and hopes for the future. The mother was asked if it would be okay for the NP to contact her in the near future by phone to offer additional support. Adolescent mothers who consented to future contact were called at three days post-partum and three weeks post-partum. Adolescent mothers who were breastfeeding at three weeks post-partum were also contacted at three months post-partum in order to investigate if they were still breastfeeding. The NP used mothers' breastfeeding practices at three months postpartum as an indication of future breastfeeding behavior.

## DESIGN

The two datasets include numerous categorical outcome variables and one continuous outcome variable. In order to accommodate these variables, I used a logistic regression SAS procedure that also allowed for a repeated measures outcome variable. The SAS GENMOD procedure allowed me to test for statistical significance of the predictor variables on the categorical predicted variables across time.

The GENMOD procedure corresponds to generalized linear models, which are a broadening of traditional linear models such as ANOVA and regression (SAS Institute Inc, 2004). The GENMOD procedure is able to include models with normal distributions and log-linear models for multinomial data (McCullah and Nelder, 1989). GENMOD is also able to use Generalized Estimating Equations (GEE). GEE offers a method that can deal with data when the normality assumption may not be appropriate, such as with discrete and correlated responses (SAS Institute Inc, 2004). GEE is appropriate for use when data can be modeled as a generalized linear model, except for the correlation among responses (Liang and Zeger, 1986).

There were a number of reasons why I used the GENMOD procedure to analyze the continuous outcome data as well as the binary outcome data. First, the distribution for the continuous data was not normally distributed. GENMOD does not assume a normal distribution. I decided not to transform the data into a normal distribution because a transformation can make it difficult to analyze the results of an analysis when the original units are given in meaningful units, such as number of days (Tabachnick & Fidell, 1989). Second, the GENMOD procedure can handle continuous outcomes and

can do an overall test for the main effect for categorical predictors. In order to accomplish this, GENMOD uses Type 3 contrasts using scale statistics (Boos, 1992; Rotnitzky & Jewell, 1990). This test is particularly useful when investigating race and ethnicity. Third, GENMOD does not have a homogeneity of variance assumption, and therefore would not be vulnerable to comparisons between groups of very different sizes (Dobson, 1990). Because of these two primary reasons, and in order to maintain continuity through the statistical analysis, I used the GENMOD procedure followed by pair-wise comparisons in the analysis of both quantitative data sets.

# Chapter 3: Results

## CENTER FOR DISEASE CONTROL (CDC) DATASET

The CDC dataset included 27,117 observations. Of those observations, 696 were children born to adolescent mothers.

I removed the variable of WIC enrollment from the analysis because the primary group of analysis, the children of adolescent mothers, had a WIC enrollment of 95%.

Using the whole CDC sample, I started by performing two tests (both were the GENMOD procedure) with the CDC dataset to see if there was a statistically significant difference in (1) breastfeeding initiation (2 categories, yes or no) and (2) breastfeeding duration (continuous, number of days child was breastfed) by maternal age. The GENMOD procedure includes pair-wise comparisons using a Type 3 analysis in order to define the differences between groups. This was utilized in all analysis including categorical variables with more than two levels.

Next, I ran a test to see if there was an interaction between maternal age and the following variables, with (1) breastfeeding initiation and (2) breastfeeding duration as the outcome variables:

1. maternal marital status
2. maternal educational attainment
3. the child's household income to poverty ratio
4. the first born status of the child
5. the race/ethnicity of child

Finally, I performed the GENMOD procedure using only the 696 adolescent mothers with the same two predicted variables, and the same predictor variables as above, except for the race/ethnicity of the child. This was in order to determine the relationship between these variables and breastfeeding within the target population of the analysis, adolescent mothers.

**Breastfeeding Initiation**

Breastfeeding initiation refers to whether or not the participating child was ever breastfed. Of the predictor variables, only race/ethnicity had an interaction with maternal age and breastfeeding initiation; therefore, the results here represent only adolescent mothers, except for the results discussing maternal age and the child's race/ethnicity.

| Variable | Degrees of Freedom | Chi-Square ($X^2$) | $p$ – value |
|---|---|---|---|
| Mother's Age Category | 2 | 14.04 | <.01 |
| Mother's Marital Status | 1 | 3.41 | 0.06 |
| Mother's Educational Attainment | 2 | 3.39 | 0.18 |
| Family Income | 1 | 1.53 | 0.21 |
| Child's Only-Child Status | 1 | 3.68 | 0.05 |
| Child's Race/Ethnicity | 3 | 41.12 | <.01 |

Table 5: CDC Breastfeeding Initiation Results

***Maternal Age***

Children of teenage mothers are less likely to be breastfed than children with mothers in their twenties, $X^2$ (1, N=27117) = 5.90, $p < 0.01$, who are less likely to be breastfed than children with mothers over 30, $X^2$ (1, N=27117) = 6.85, $p < 0.01$ (see Figure 1).

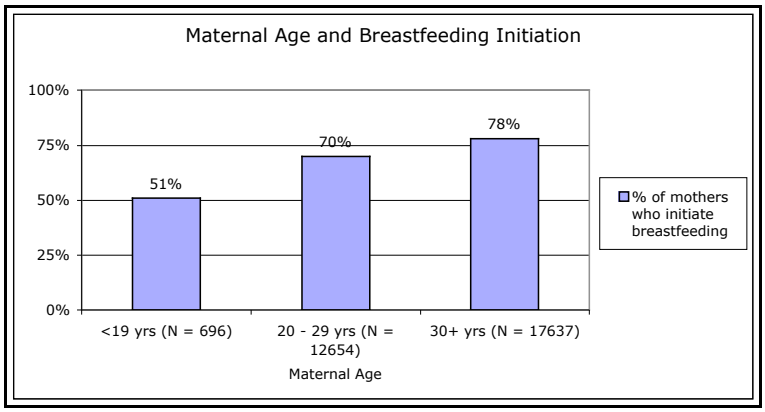


Figure 1: Maternal Age and Breastfeeding Initiation

***Maternal Marital Status***

Children of married adolescent mothers were somewhat more likely to be breastfed than children of non-married mothers, $X^2$ (1, N=696) = 3.41, $p < 0.06$. While this p-value is slightly above the .05 level, it may be that this is due to a relatively low number of married mothers in the sample. Figure 2 indicates that the percentage of breastfeeding initiation between the two groups differs by 25% (see Figure 2).

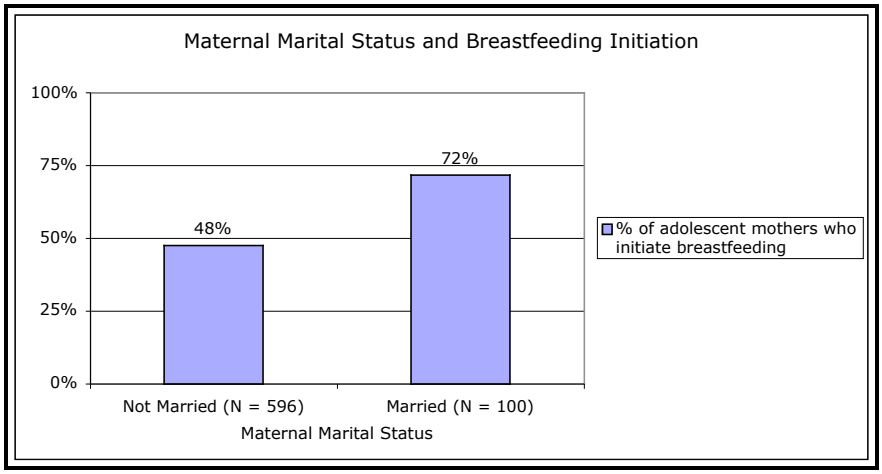


Figure 2: Maternal Marital Status and Breastfeeding Initiation

***Maternal Educational Attainment***

There is no statistically significant difference in breastfeeding initiation according to maternal educational attainment for adolescent mothers, $X^2$ (1, N=696) = 3.38, $p = 0.18$ (see Figure 3).

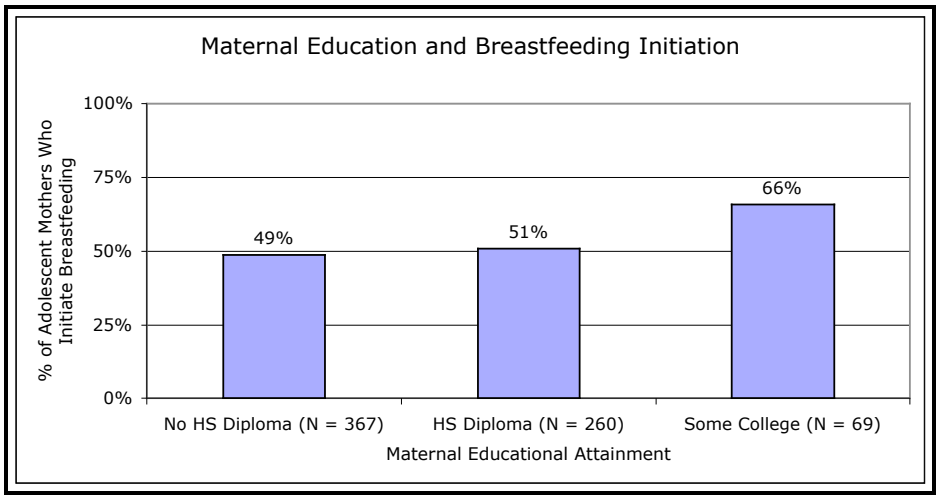


Figure 3: Maternal Education and Breastfeeding Initiation

***Household Income***

Children with adolescent mothers who live in households with higher income levels are no more likely to be breastfed than children with adolescent mothers who live in households with lower income levels $X^2$ (1, N=696) = 1.53, $p$ = .21 (see Figure 4).

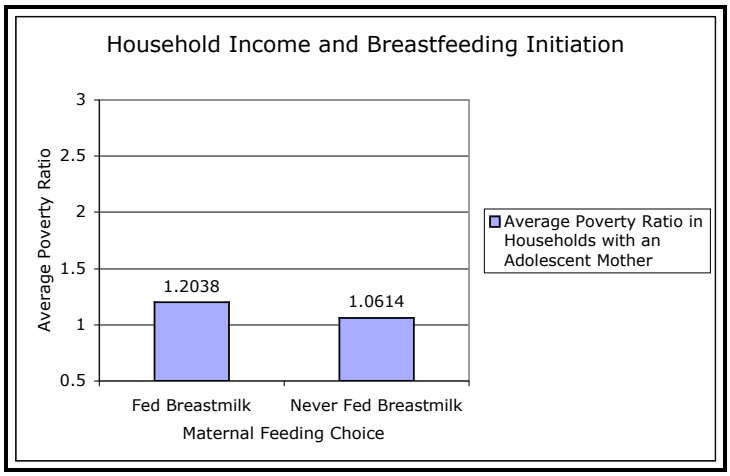


Figure 4: Household Income and Breastfeeding Initiation

***Child's First Born Status***

Only children born to adolescent mothers are marginally more likely to be breastfed than children with siblings born to adolescent mothers $X^2$ (1, N=696) = 3.68, $p$ = 0.05 (see Figure 5).

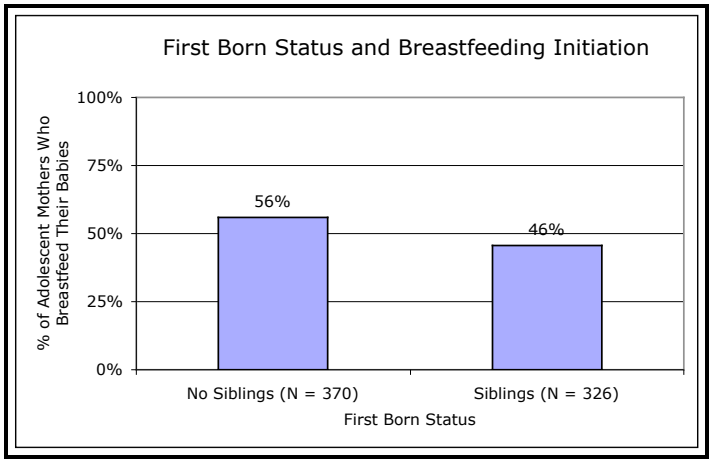


Figure 5: First Born Status and Breastfeeding Initiation

***Child's Race/Ethnicity***

For the outcome of breastfeeding initiation, the only variable that interacted with age for the whole sample is the child's race/ethnicity. First I will describe how race/ethnicity is correlated with infant feeding choices for mothers 20 years old and older, and then I will describe the same correlation for only adolescent mothers.

The information presented here refers to mothers 20 years old and older. Hispanic children are more likely to be breastfed than Anglo children, $X^2$ (1, N=27117) = 228.63, $p < 0.01$, African American children, $X^2$ (1, N=27117) = 530.35, $p < 0.01$, or children of other racial groups, $X^2$ (1, N=27117) = 101.68, $p < 0.01$. Anglo children are more likely to be breastfed than African American children, $X^2$ (1, N=27117) = 135.83, $p < 0.01$, and as likely to be breastfed as children of other racial groups, $X^2$ (1, N=27117) =1.18, $p = 0.27$. African American children are less likely to be breastfed than children of other racial groups, $X^2$ (1, N=27117) = 88.20, $p < 0.01$. To clarify, Hispanic children are the most likely to be breastfed, followed by Anglo children and children of other

racial groups, and African American children are the least likely to be breastfed (see Figure 6). These are the associations between breastfeeding initiation and the child's race/ethnicity for babies with mothers 20 years old and older.

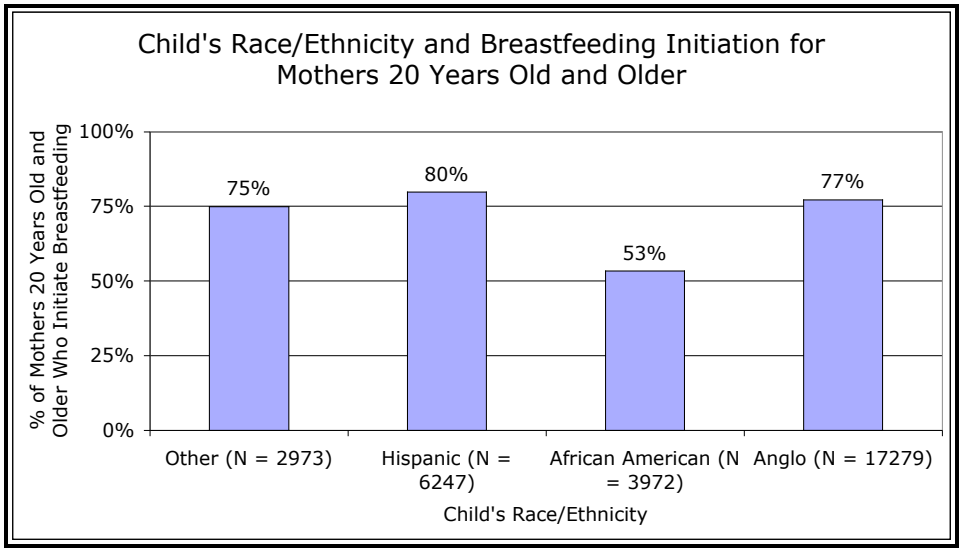


Figure 6: Child's Race/Ethnicity and Breastfeeding Initiation for Mothers 20+

As within the older population of mothers, for children of adolescent mothers, Hispanic children are significantly more likely to be breastfed than children of all other race/ethnicities. Children of Anglo adolescent mothers are more likely to be breastfed than children of African American adolescent mothers, $X^2$ (1, N=27117) = 11.60, $p < 0.01$. However, there is no statistical difference between children of adolescent mothers of other racial groups and children of Anglo adolescent mothers, $X^2$ (1, N=27117) = 2.64, $p = 0.10$, or between children of adolescent mothers of other racial groups and children of African American adolescent mothers, $X^2$ (1, N=27117) = 0.60, $p = 0.43$.

In other words, children of adolescent mothers who are Hispanic are breastfed the most often, followed by children of adolescent mothers who are Anglo, other racial

groups, and African American. The only statistically significant difference between these last three groups is that children of Anglo adolescent mothers are breastfed more often that children of African American adolescent mothers (see Figure 7).

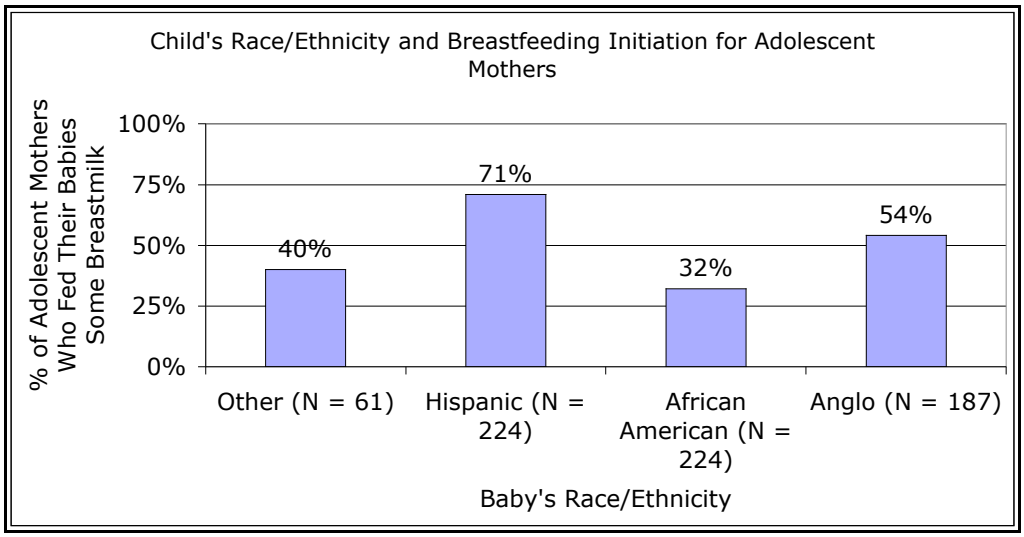


Figure 7: Child's Race/Ethnicity and Breastfeeding Initiation for Adolescent Mothers

When comparing these two figures, what becomes clear is that Hispanic adolescent mothers initiate breastfeeding at rates similar to those of older mothers in their race/ethnic background (see Figure 8). Adolescent mothers from other racial/ethnic backgrounds breastfeed at rates far below older mothers of similar backgrounds.

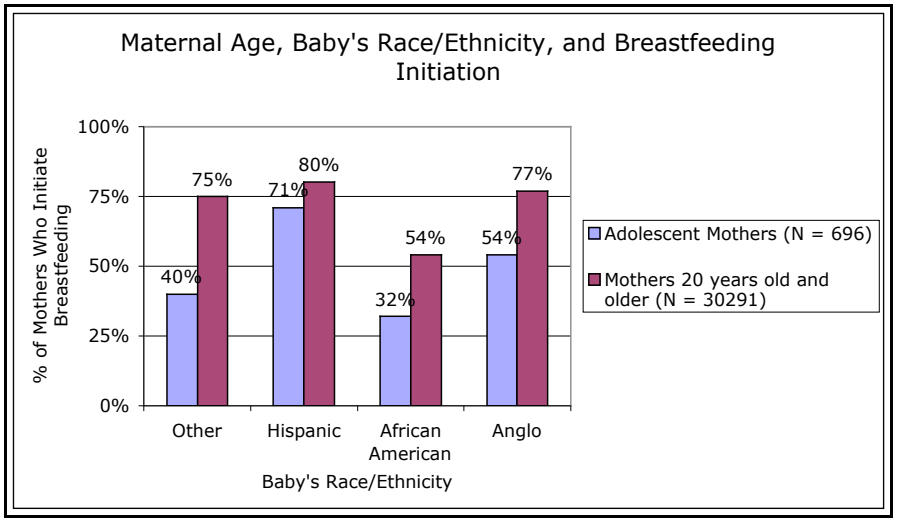


Figure 8: Maternal Age, Baby's Race/Ethnicity, and Breastfeeding Initiation

**Breastfeeding Duration**

Breastfeeding duration refers to the length of time, in days, that the participating child was breastfed. Of the predictor variables, only race/ethnicity had an interaction with maternal age and breastfeeding initiation; therefore, the results here represent only adolescent mothers, except for the results discussing maternal age and the child's race/ethnicity.

| Variable | Degrees of Freedom | Chi-Square ($X^2$) | $p$ – value |
|---|---|---|---|
| Mother's Age Category | 2 | 151.97 | <0.01 |
| Mother's Marital Status | 1 | 0.25 | 0.61 |
| Mother's Educational Attainment | 2 | 2.43 | 0.29 |
| Family Income | 1 | 0.45 | 0.50 |
| Child's Only-Child Status | 1 | 3.57 | 0.05 |
| Child's Race/Ethnicity | 3 | 70.46 | <0.01 |

Table 6: CDC Breastfeeding Duration Results

***Maternal Age***

Children of teenage mothers are likely to be breastfed for a shorter duration than children with mothers in their twenties, $X^2$ (1, N=27117) = 10.11, $p < 0.01$, who are likely to breastfed for a shorter duration than children with mothers over 30, $X^2$ (1, N=27117) = 135.95, $p < 0.01$ (see Figure 9).

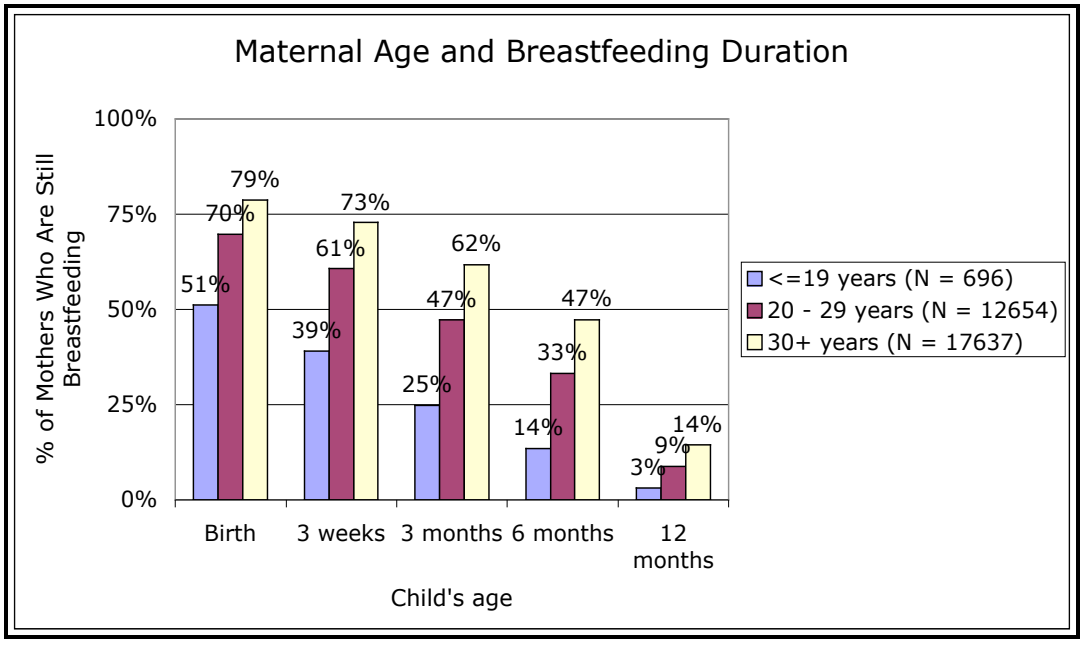


Figure 9: Maternal Age and Breastfeeding Duration

***Maternal Marital Status***

Children of married adolescent mothers are likely to be breastfed for about as long as children of non-married adolescent mothers, $X^2$ (1, N=696) = 0.25, $p$ = 0.61 (see Figure 10).

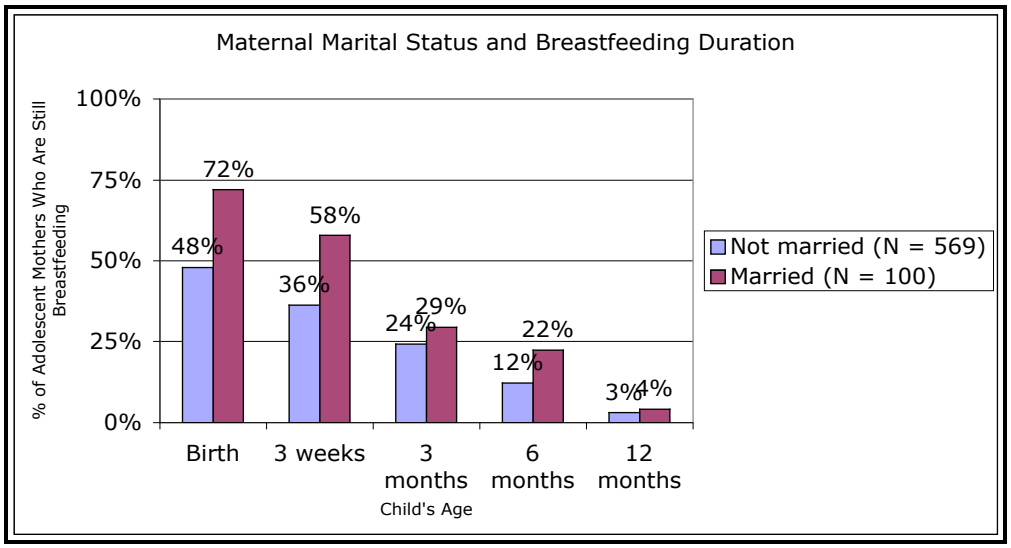

Figure 10: Maternal Marital Status and Breastfeeding Duration

***Maternal Educational Attainment***

Data analysis indicates that maternal educational attainment has no statistical association with breastfeeding duration, $X^2$ (1, N=696) = 3.39, $p$ = 0.18 (see Figure 11).

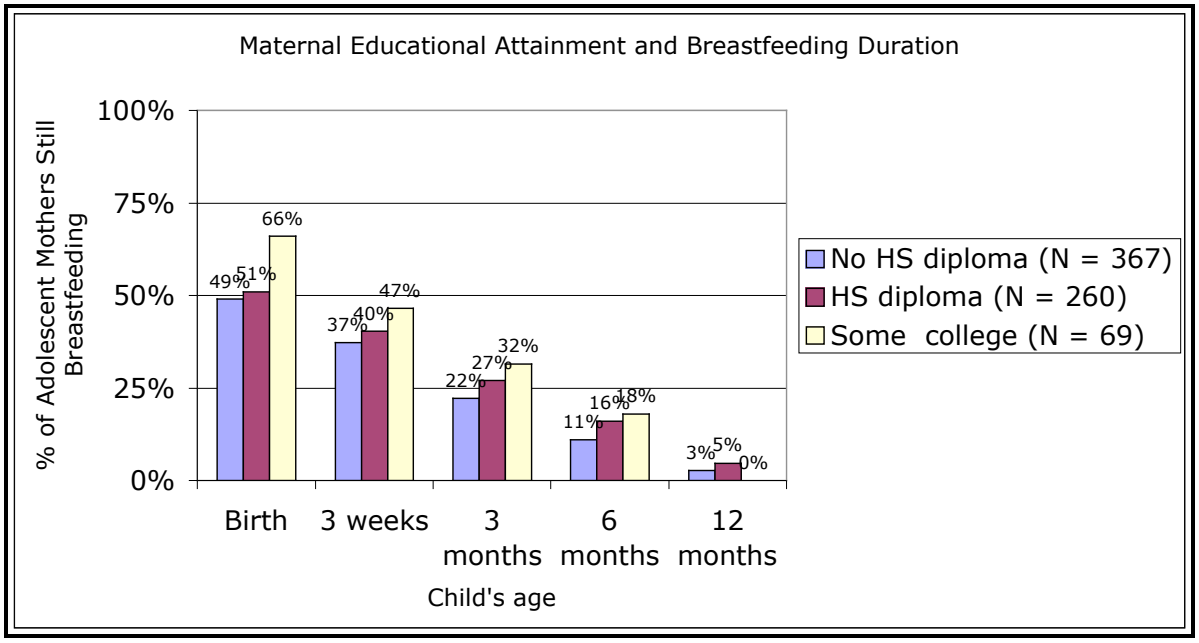


Figure 11: Maternal Educational Attainment and Breastfeeding Duration

***Household Income***

Children of adolescent mothers are likely to be breastfed for approximately the same duration, regardless of household income, $X^2$ (1, N=696) = 1.53, $p$ = 0.21 (see Figure 12).

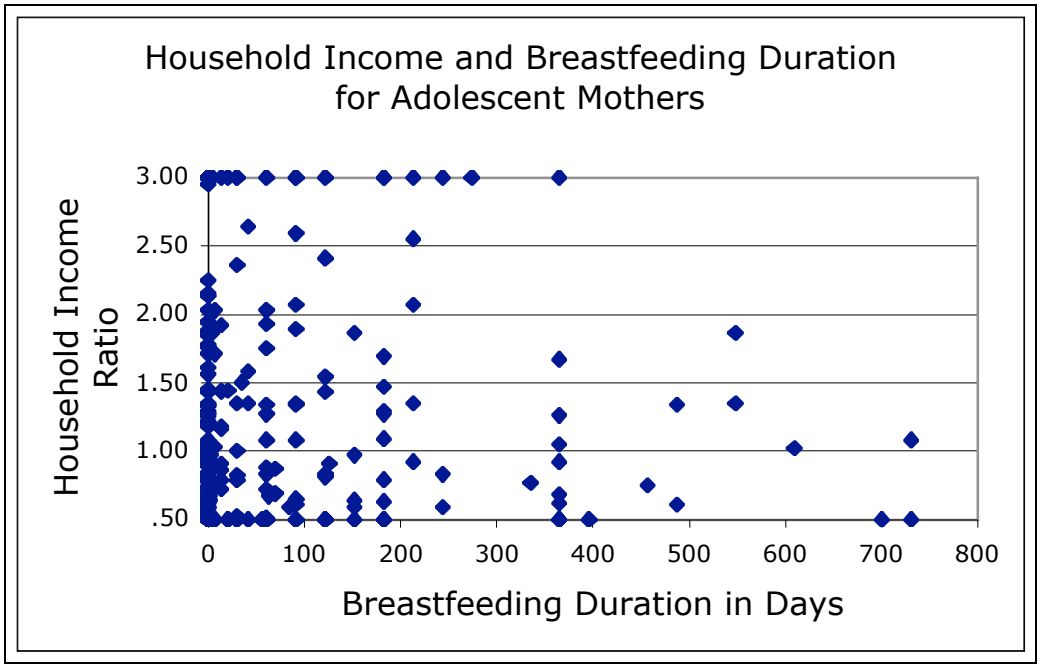


Figure 12: Household Income and Breastfeeding Duration

***Child's First Born Status***

Only children of adolescent mothers are likely to be breastfed for a somewhat longer duration than children of adolescent mothers with siblings $X^2$ (1, N=696) = 3.68, $p$ = .05 (see Figure 13).

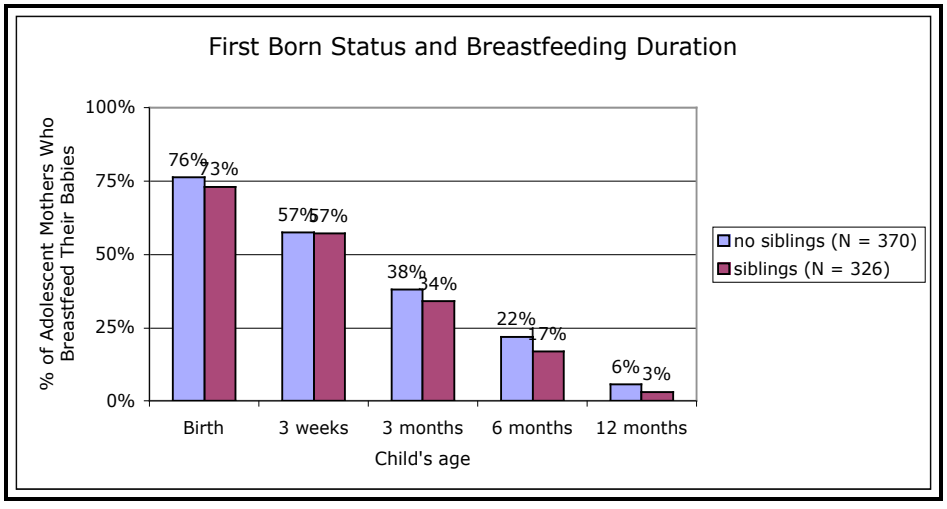

Figure 13: First Born Status and Breastfeeding Duration

***Child's Race/Ethnicity***

For the outcome of breastfeeding duration, as with breastfeeding initiation, the only variable that interacts with age is the child's race/ethnicity. First I will describe how race/ethnicity interacts with infant feeding choices for mothers 20 years old and older, and then I will describe the same interactions for only adolescent mothers.

The information presented here refers to mothers 20 years old and older. Hispanic children are likely to be breastfed for the same duration as Anglo children, $X^2$ (1, N=27117) = 1.10, $p = 0.29$. Hispanic and Anglo children are likely to be breastfed for a longer time than African American children, $X^2$ (1, N=27117) = 41.23, $p < 0.01$, but for a shorter time than children of other racial groups, $X^2$ (1, N=27117) = 7.11, $p < 0.01$. To clarify, children of other racial groups are likely to be breastfed for the longest, followed by Anglo children and Hispanic children, and African American children are likely to be breastfed for the shortest duration (see Figure 14). These are the relationships between breastfeeding duration and the child's race/ethnicity for babies with mothers 20 years old and older.

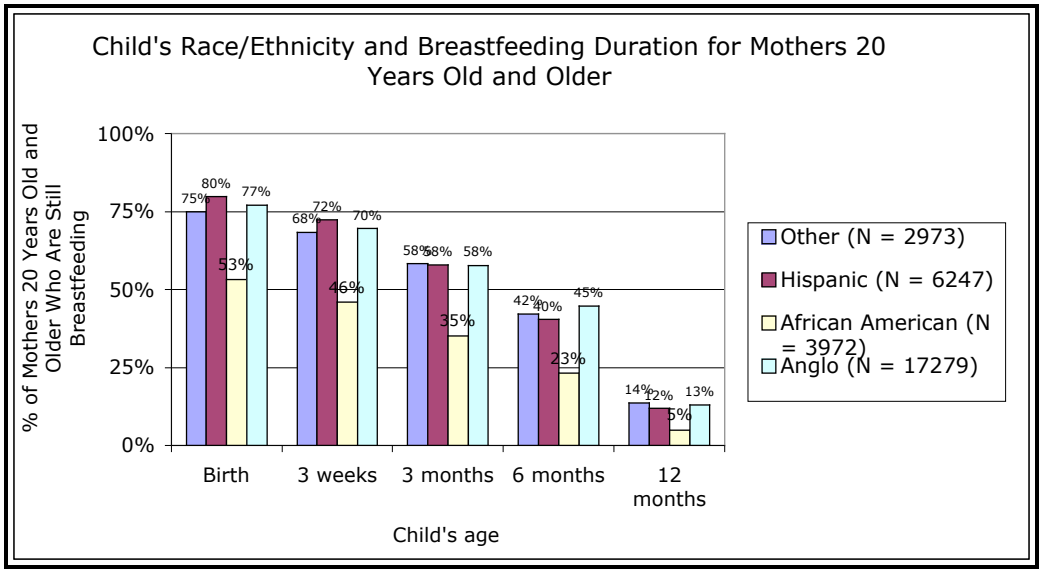


Figure 14: Child's Race/Ethnicity and Breastfeeding Duration for Mothers 20+

Among children of adolescent mothers, there is no statistically significant difference for the duration of breastfeeding between any of the race/ethnicity groups (see Figure 15).

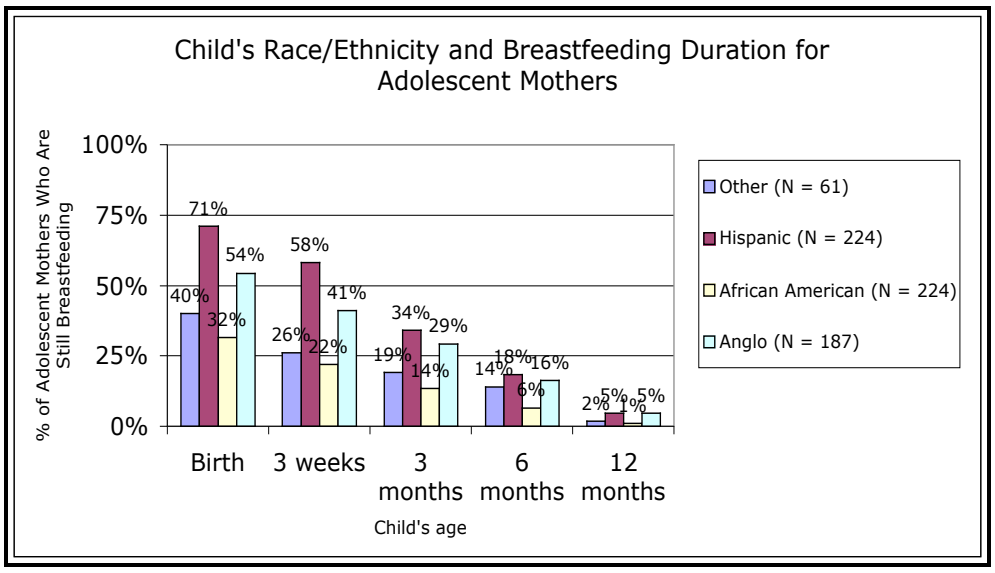


Figure 15: Child's Race/Ethnicity & Breastfeeding Duration for Adolescent Mothers

**NON-PROFIT QUANTITATIVE RESULTS**

The Non-Profit Agency (NP) quantitative dataset included 449 participants.

I began with a preliminary analysis to investigate the possibility of an effect of hospital on the outcome variables by running an initial GENMOD procedure with hospital as the only predictor variable. The GENMOD procedure indicated a significant effect of hospital, which may have been due to very low participant numbers at two of the hospitals. I removed the participants from these hospitals in order to reduce the hospital effect. However, there still remained a small hospital effect, so I included hospital as variable (with four hospitals) in the overall analysis. My final model used the GENMOD procedure. The predictor variables in this dataset are:

1. the age of the mother at time of birth
2. the total number of children born to the mother
3. hospital of birth

4. the mother's ethnicity
5. whether the child was born by C-section
6. whether the child was admitted into the Neonatal Infant Care Unit

The outcome variable is a repeated measure variable (in the hospital and at three days, three weeks, and three months postpartum) of whether the mother fed her infant at least some breast milk or exclusively formula.

In addition to this quantitative dataset, the non-profit agency gathered qualitative information from a subsection of the adolescent mothers at three weeks postpartum about the reasons behind their feeding choices. This data will be discussed following the quantitative datasets.

**Correlation with Birth Hospital**

Before beginning the primary analysis, I analyzed the statistical significance of hospital group, and found that the hospital where the mother gave birth was associated with her breastfeeding choices, $X^2$ (3, N=449) = 33.27, $p$ = <0.01. Two of the hospital groups had very low participation rates (two or three participants), and the inclusion of these hospital groups was distorting the analysis procedure, so I did not include them in the primary analysis. Therefore, the primary analysis included 444 participants, with data gathered at four times per participant for a total of 1779 observations.

**Correlation with Maternal Age**

Initial analysis indicated that mother's age (3 groups: 11 – 14, 15 – 17, 18 – 19) was not statistically significantly associated with her breastfeeding choices. Because one of my primary hypotheses predicted statistical significance, I ran the GENMOD procedure including mother's age as the only predictor variable. This allowed me to ensure that the effects of the other variables were not distorting the significance of mother's age on her breastfeeding choices. However, even with the increased power associated with reduced predictor variables, mother's age continued to show no significant association with breastfeeding choices, $X^2$ (2, N=444) = 0.17, $p$ = 0.91.

Given that there was no significant relationship associated with mother's age, and the large number of variables included in this model, I did not include mother's age in the primary analysis. Reducing the number of variables allowed the GENMOD procedure more power in the overall statistical analysis.

**Primary Analysis**

The data analysis indicates that the total number of children, the mother's ethnicity, the hospital in which a mother gave birth, whether the child is in the Neonatal Infant Care Unit (NICU), and the age of the baby are all significantly associated with a mother's breastfeeding choices. The method of birth (vaginal or c-section) is marginally associated with a mother's breastfeeding choices.

| Variable | Degrees of Freedom | Chi-Square ($X^2$) | $p$-value |
|---|---|---|---|
| Number of children | 2 | 8.40 | <.01 |
| Ethnicity | 3 | 19.53 | <.01 |
| Hospital | 3 | 33.27 | <.01 |
| NICU | 1 | 7.57 | <.01 |
| Age of baby | 3 | 108.49 | <.01 |
| Birth method | 1 | 3.52 | 0.06 |

Table 7: NP Results

***Number of Children***

Adolescent mothers with one child are more likely to breastfeed than adolescent mothers with two children, $X^2$ (1, N=444) = 3.95, $p < .05$, or adolescent mothers with three or more children, $X^2$ (1, N=444) = 6.86, $p < .01$. There is no statistical difference in the likelihood to breastfeed for adolescent mothers with two or three or more children, $X^2$ (1, N=444) = 1.54, $p = 0.21$.

Nevertheless, as can be seen in the graph, there may be differences in breastfeeding rates and duration for adolescent mothers with three or more children that were not apparent in this sample, due to the fact that only 5% of the mothers in this sample had that many children (see Figure 16). Further investigation with adolescent mothers with three or more children may provide more insight into this issue.

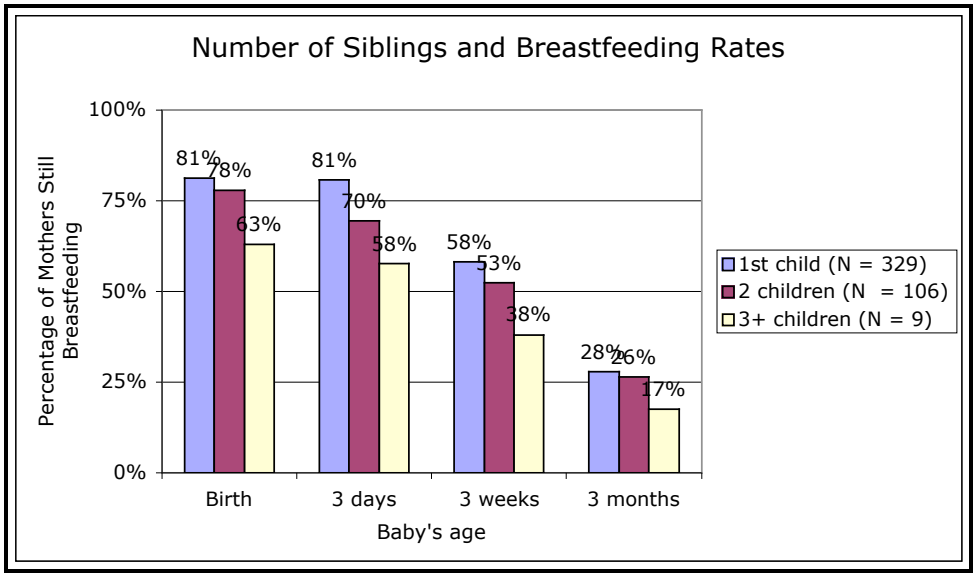


Figure 16: Number of Siblings and Breastfeeding Rates

***Ethnicity***

Hispanic adolescent mothers breastfeed their children at about the same rates as Asian/other adolescent mothers, $X^2$ (1, N=444) = 0.24, $p$ = 0.62, and Anglo adolescent mothers, $X^2$ (1, N=444) = 0.16, $p$ = 0.6903, but are more likely to breastfeed their children than African American adolescent mothers, $X^2$ (1, N=444) = 24.66, $p$ = <.01. African American adolescent mothers are also less likely to breastfeed their children than Asian/other adolescent mothers, $X^2$ (1, N=444) = 3.88, $p$ < .05, and Anglo adolescent mothers, $X^2$ (1, N=444) = 13.26, $p$ < 0.01. To clarify, Hispanic, Asian/other, and Anglo mothers are all about as likely to breastfeed their children, and are all significantly more likely to breastfeed their children than African American adolescent mothers (see Figure 17).

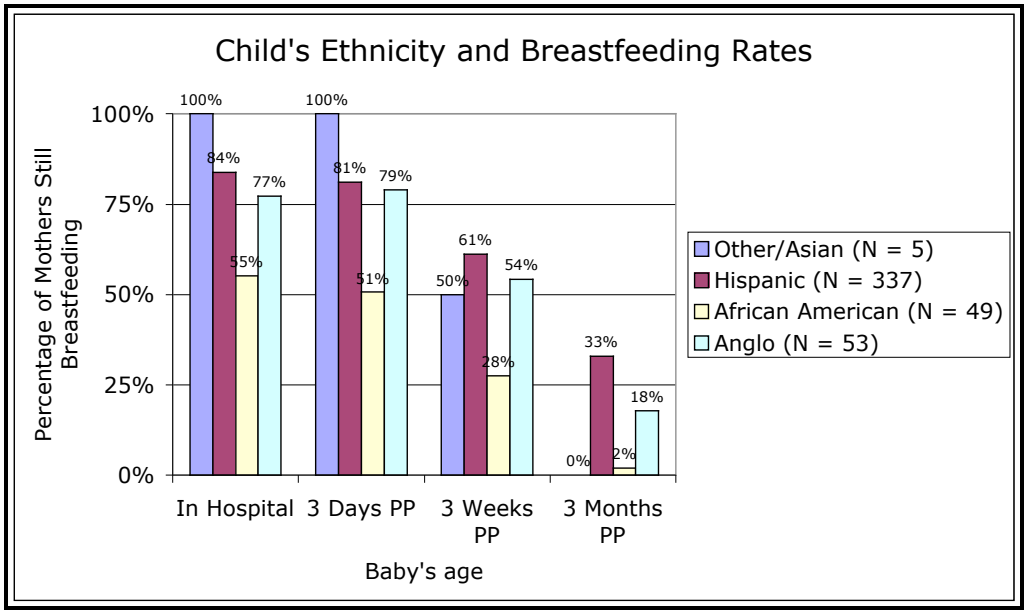


Figure 17: Child's Ethnicity and Breastfeeding Rates

***Hospital***

There were four hospitals included in this analysis. Adolescent mothers who give birth in Hospital 4 and Hospital 3 are about as likely to breastfeed their babies, $X^2$ (1, N=444) = 1.46, $p = 0.22$. Adolescent mothers who give birth in Hospital 1 and Hospital 2 are about as likely to breastfeed their babies, $X^2$ (1, N=444) = 0.59, $p = 0.44$. Adolescent mothers who give birth in Hospital 4 are more likely to breastfeed their babies than adolescent mothers who give birth in Hospital 1, $X^2$ (1, N=444) = 5.77, $p < 0.01$, or Hospital 2, $X^2$ (1, N=444) = 15.48, $p < .01$. Adolescent mothers who give birth in Hospital 3 are marginally more likely to breastfeed their babies than adolescent mothers who give birth in Hospital 1, $X^2$ (1, N=444) = 3.27, $p = 0.07$, and significantly more likely to breastfeed their babies than mothers who give birth in Hospital 2, $X^2$ (1, N=444) = 20.30, $p < .01$. To clarify, adolescent mothers are most likely to breastfeed

their babies if they give birth in Hospital 4 or Hospital3, followed by Hospital 1 and Hospital 2 (see Figure 18).

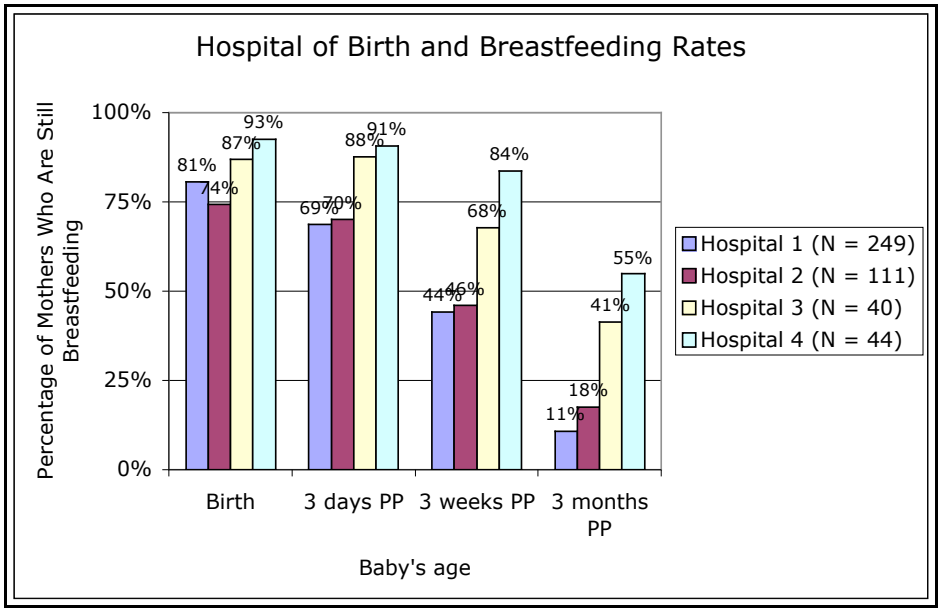


Figure 18: Hospital of Birth and Breastfeeding Rates

These results are particularly provocative given the differences between these specific hospitals. Hospitals 1 and 2 both have lactation consultants on staff, and Hospital 2 offers follow-up breastfeeding support after the mother and baby go home. Hospital 1 does not give out pacifiers, while Hospital 2 only gives them out on request. These trends are in substantial contrast to Hospitals 3 and 4, where there are no lactation consultants, the nurses are not trained in breastfeeding support, and both hospitals give out pacifiers routinely.

These hospitals differ substantially in terms of the clientele they serve in addition to their staff and procedures. Hospital 1 serves primarily private insurance patients, with only 1% on Medicaid, and only 8% of all the mothers who give birth there are Hispanic.

Hospital 2 serves a somewhat more diverse population, with 50% on Medicaid, 37% Hispanic, and it also serves as the primary hospital for a community clinic. Hospital 3 serves 74% Medicaid patients and 60% of the mothers who give birth there are Hispanic. Hospital 4 serves 100% Medicaid patients, and 90% of the mothers who give birth there are Hispanic. Hospitals 3 and 4 are known as the hospitals that recent immigrants from Mexico are more likely to frequent, when compared to Hospitals 1 or 2.

The results shown in the graph indicate the possibility of a very interesting relation between the variables of hospital procedures and clientele.

***NICU***

Adolescent mothers whose children are admitted to the NICU after their birth are more likely to breastfeed their children, $X^2$ (1, N=444) = 7.57, $p < 0.01$. This difference diminishes over time, so there is almost no difference in breastfeeding between babies admitted to the NICU and those not admitted to the NICU by 3 months (see Figure 19).

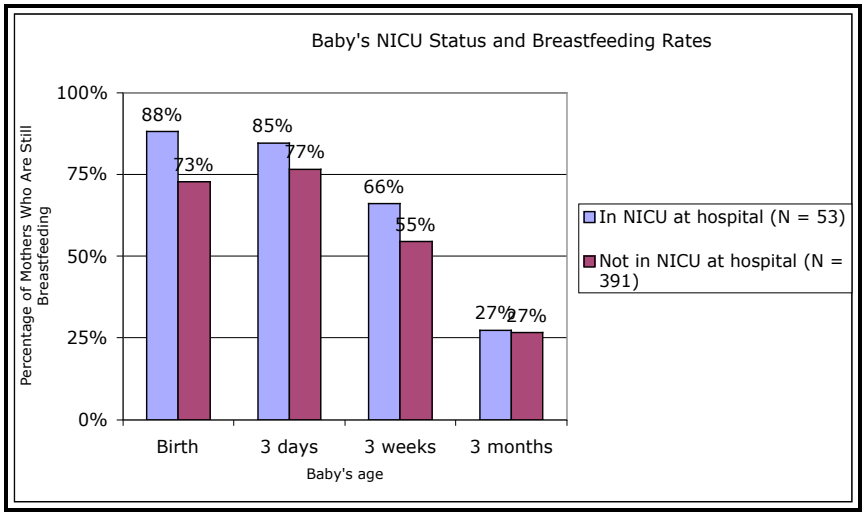


Figure 19: Baby's NICU Status and Breastfeeding Rates

***Age of Baby***

Adolescent mothers are about as likely to be breastfeeding their baby while they are still in the hospital as they are at three days PP, $X^2$ (1, N=444) = 3.42, $p$ = 0.06, and are significantly more likely to be breastfeeding their baby while still in the hospital than they are at three weeks PP, $x^2$ (1, N=444) = 90.69, $p < .01$, or at three months PP, $X^2$ (1, N=444) = 42.78, $p < .01$. Adolescent mothers are significantly more likely to be breastfeeding their baby at three days PP than they are at three weeks PP, $X^2$ (1, N=444) = 79.99, $p < .01$, or at three months PP, $X^2$ (1, N=444) = 49.78, $p < .01$. There is no statistical difference in the likelihood that adolescents will be breastfeeding their babies at three weeks or three months PP, $X^2$ (1, N=444) = 0.05, $p$ = 0.82. To clarify, adolescent mothers are about as likely to be breastfeeding at three days PP than while still in the hospital, and are significantly less likely to be breastfeeding at either three weeks and three months (see Figure 20).

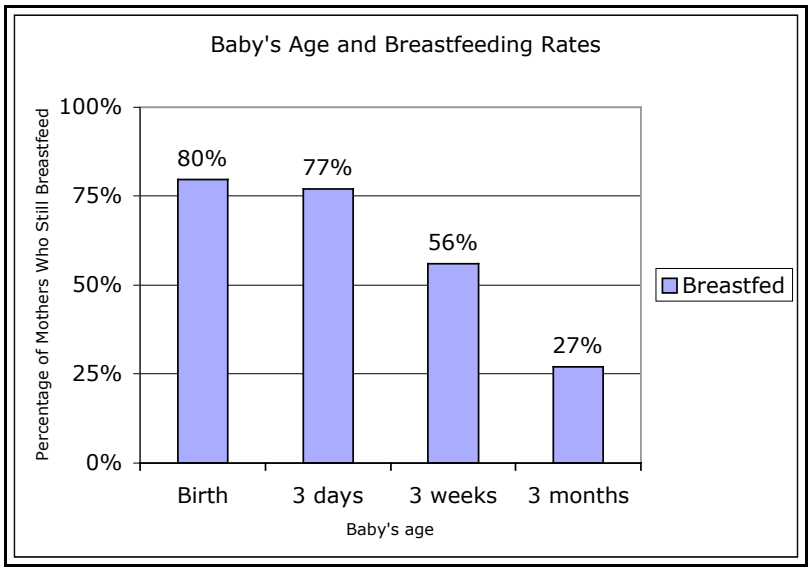


Figure 20: Baby's Age and Breastfeeding Rates

***Birth Method***

Adolescent mothers who give birth vaginally are more likely to breastfeed their babies than adolescent mothers who had a c-section, $X^2$ (1, N=444) = 3.52, $p$ = 0.06 (see Figure 21).

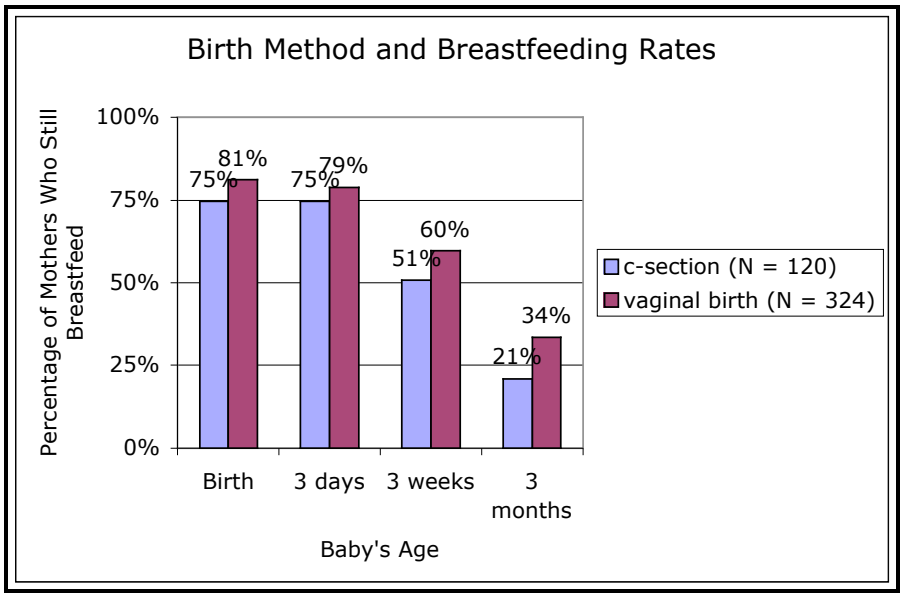


Figure 21: Birth Method and Breastfeeding Rates

## NON-PROFIT QUALITATIVE RESULTS

The Non-Profit qualitative dataset included 48 participants.

### Coding

Adolescent mothers' responses to the question "Why did you decide to feed your baby _____?" were typed into a list. (See appendix for the complete list.) From this list of complete answers, I gathered 27 reasons the mothers provided, 17 for feeding formula and 10 for feeding breastmilk. Then I organized this list of 27 reasons into four themes. Theme 1 is external suggestion (ex.: "My older son was jealous."). Theme 2 is

intrinsic to the feeding method (ex.: “Everyone said it’s so much healthier for him.”). Theme 3 is the other method didn’t work (ex.: “Breastfeeding hurt, so I just gave her formula.”). Theme 4 is doesn’t know (ex.: “I don’t know why, I just did.”).

Theme 1 was cited by 10 mothers, Theme 2 was cited by 14 mothers, Theme 3 was cited by 31 mothers, and Theme 4 was cited by 2 mothers. Mothers cited reasons in Themes 1 and 2 for breastfeeding, and in all themes for formula feeding. Nine mothers cited reasons in more than one theme as answers. In these cases, both reasons were coded, but only the first reason stated by the mother was included in the statistical analysis.

**Statistical Analysis**

I began by investigating the possibility of a relationship between several variables and the theme given by the mother for her infant feeding choice. The following independent variables were included in the analysis:

1. feeding method in the hospital (only breast milk, breast milk and formula, or only formula)
2. feeding method at 3 weeks postpartum (only breast milk, breast milk and formula, or only formula)
3. hospital birth took place in (Hospital 1 or Hospital 2)
4. mother’s race/ethnicity (African American, Hispanic, or Anglo)

Of these variables the only one which was significantly related to the theme of the mother’s reason for her feeding method choice was the feeding method used at three weeks postpartum, $X^2$ (2, 48) = 12.537, $p < .01$.

Based on these results, I used a crosstabs analysis of the relationship between the feeding method in the hospital and the stated theme and between the feeding method at three weeks postpartum and the stated theme. I included the analysis of the feeding method in the hospital and the stated theme in order to see the changes that occurred which made that relationship insignificant, but the relationship between the feeding method at three weeks and the stated theme statistically significant. As can be seen in the Figures 22 and 23, the results from the crosstabs analysis supported the results from the original analysis by showing that (1) the relationship between the feeding choice theme and the feeding choice both in the hospital and (2) the relationship between the feeding choice theme and the feeding choice at three weeks postpartum are dramatically different.

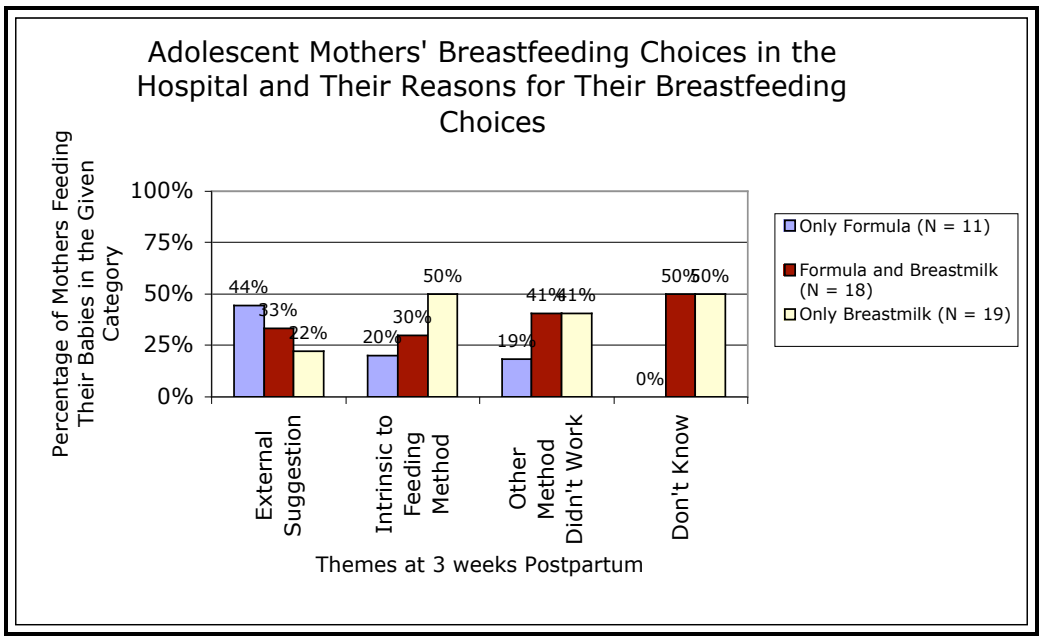


Figure 22: Adolescent Mothers' Breastfeeding Choices in the Hospital and Their Reasons for Their Breastfeeding Choices

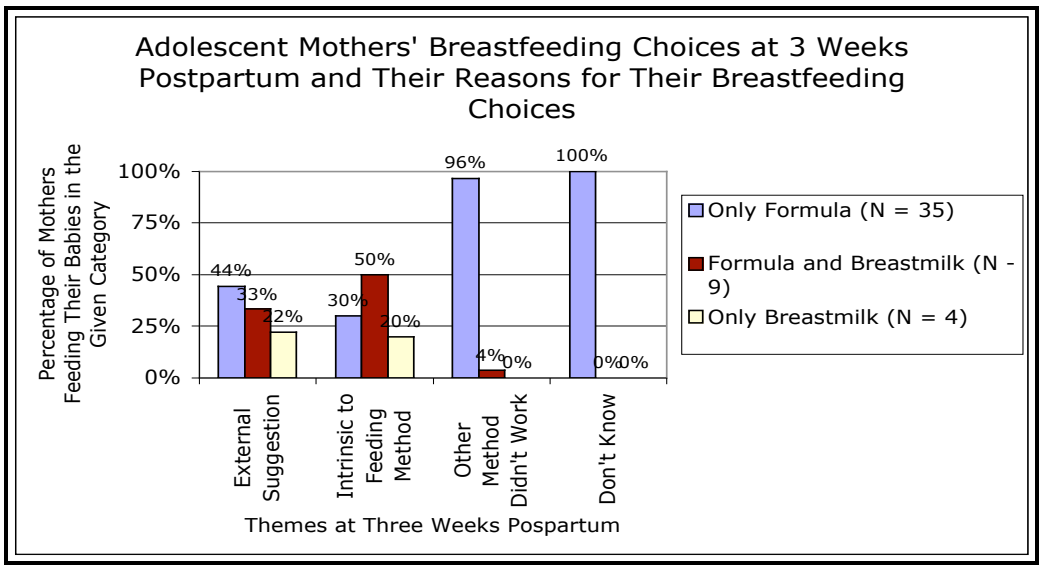


Figure 23: Adolescent Mothers' Breastfeeding Choices at 3 Weeks Postpartum and Their Reasons for Their Breastfeeding Choices

As can be seen in the differences between Figure 22 and Figure 23, many more mothers started out breastfeeding exclusively (19 of 48) or partially (18 of 48) than were breastfeeding exclusively (4 of 48) or partially (9 of 48) by three weeks postpartum, regardless of the reason given for their feeding choices. However, two particularly interesting trends in these data are the movement within Theme 3 (the other method didn't work) and Theme 4 (doesn't know). Mothers who cited reasons within these two themes for why they chose a specific feeding method moved in notable numbers from breastfeeding to formula feeding.

Mothers who offered reasons within Theme 4 all switched from at least some breast milk to exclusive use of formula. However, this group is very small, with only two mothers providing this answer. Of perhaps greater note is the number of mothers who answered within Theme 3, and who began feeding their children at least some breast milk

(22), but then switched to formula because breastfeeding did not work (21). This indicates that more than 40% of all of the mothers in this qualitative sample were breastfeeding partially or exclusively but quickly, within the first three weeks postpartum, switched to formula because breastfeeding did not work for them.

Also of particular importance in this analysis is that neither the mothers' racial/ethnic background nor the birth hospital was correlated with the reason the mother gave for her infant feeding decision. It is interesting that both of these variables were highly correlated with breastfeeding rates, but not the reasons behind them.

# Chapter 4: Discussion

The purpose of this dissertation was to explore the variables associated with adolescent mothers' infant feeding choices. Past research has indicated that breastfeeding is associated with a number of benefits for both mother and child, including physical, economic, and psychological variables. The American Academy of Pediatrics believes the impact of breastfeeding to be substantial enough to recommend babies be fed breast milk exclusively for six months and alongside solid foods through one year. This may be particularly relevant for adolescent mothers because breastfeeding may provide benefits for adolescent mothers and their children in areas for which they are often at particularly high risk for problems. However, little is known about the patterns associated with higher or lower breastfeeding rates among adolescent mothers. This dissertation addressed this issue by analyzing breastfeeding initiation and duration rates among adolescent mothers, and their association with a range of demographic variables. Specifically, I analyzed the association between infant feeding method and maternal age, maternal marital status, maternal educational attainment, household income, race/ethnicity, the child's number of siblings, Neonatal Infant Care Unit (NICU) admission status, birth method, and hospital of birth. I supplemented this quantitative analysis with qualitative answers from adolescent mothers explaining their feeding decisions.

## DEMOGRAPHIC VARIABLES

Previous research has investigated the correlations between many maternal and baby demographics with maternal infant feeding choices. However, much of this previous work has not looked closely at these same relationships for adolescent mothers. This dissertation began the process of incorporating maternal age into the analysis of demographic variables and breastfeeding initiation and duration rates.

### Maternal Age

Maternal age can be considered two ways: (1) the differences between adolescent mothers and older mothers and (2) the differences between younger, middle, and older adolescent mothers. This dissertation analyzed breastfeeding rates using both of these groups.

#### *Older Mothers and Adolescent Mothers*

Past research has indicated that older mothers tend to breastfeed their children at increased initiation and duration rates when compared to adolescent mothers (Li, et al, 2005). This study replicated these findings. Because of the strength of the previous research in this area, this particular result is perhaps one of the most predictable and unsurprising results in this analysis. However, I suggest that it is still the most important one to closely attend to. This analysis indicates that adolescent mothers, to a large degree, do not breastfeed their children. The qualitative data analysis indicates that many of these adolescent mothers were not breastfeeding by three weeks postpartum, not because they weren't willing to try it, not because it seemed to bother their self-image, and not because someone (like their mother or boyfriend) told them not to, but because

they perceived that breastfeeding didn't work for a variety of physical and/or psychological reasons.

One possible explanation for these findings is that adolescents mothers tend, as is common among adolescents, towards increased levels of egocentricity (Steinberg, 1999), and therefore may be unable to make the physical and emotional commitment to their babies that breastfeeding requires. That is, adolescent mothers may perceive that breastfeeding doesn't work because it is difficult or doesn't initially feel good, so they halt their breastfeeding attempts. It may also be that because of adolescents' increased tendency towards exaggeration and false causation (Steinberg, 1999), adolescent mothers may incorrectly identify normal breastfeeding difficulties as breastfeeding failure.

The two above explanations suggest that a fruitful area for future research is whether more education and support may be required in order for adolescent mothers to form and maintain successful breastfeeding relationships with their children. In other words, future research should focus on the impact that healthcare professionals, family, and friends, have on maternal infant feeding choices, and whether that impact is quantitatively higher for adolescent mothers than it is for older mothers. It may be that education about expectations and support for the physical requirements of breastfeeding should be addressed to all of the individuals within an adolescent mother's wide support network in order for adolescent mothers to have successful breastfeeding relationships with their babies.

Another possible area for future research is whether adolescent mothers are not psychologically ready to enter into the very intimate and identity-defining relationship of

a breastfeeding mother. This possible research could be based on the literature on normal adolescent psychological development, and in particular on the variances experienced in psychological development by adolescent mothers. Because developmentally adolescents have not yet completed the process of defining who they are and how to interact within intimate relationships, it is likely they will demonstrate a deficit in their innate ability to parent in a way which fosters fully appropriate social development and healthy attachment for their babies. It may be that when adolescent mothers breastfeed their babies they have less energy available to devote to their own identify formation and intimacy skills, their own psychological development. This possible reduction in energy could offset the positive effects gained through breastfeeding.

These two interpretations suggest very different paths for people working with adolescent mothers. According to the first interpretation, adolescent mothers need extraordinary amounts of support across many different levels to initiate and maintain a breastfeeding relationship with their baby, and it may be that substantial benefits would occur from those extraordinary levels of support. However, according to the second interpretation, adolescent mothers may need lots of support to make their own feeding decisions, with an understanding that breastfeeding may not meet a healthy proportion of a gain/loss ratio for adolescent mothers.

***Adolescent Mothers***

Previous research has thoroughly investigated the relationship between maternal age and breastfeeding for adolescent mothers and older mothers, but has not investigated age related differences within the adolescence. This study extended previous research by

analyzing differences in breastfeeding rates for younger, middle, or older adolescent mothers. I hypothesized that, due to the substantial psychological and cognitive developments that occur during adolescents, older adolescent mothers would breastfeed significantly more often and for a longer time than younger adolescents.

Contrary to expectations, I found no statistically significant differences between older and younger adolescents for breastfeeding rates. Rather, all adolescents breastfeed at approximately similar rates and for a similar duration.

One possible explanation for this lack of significance is that there are significant differences between the oldest and youngest adolescent mothers' breastfeeding rates over time that were not detected in this study because of the relatively small number of mothers in the youngest group.

A second explanation is that older adolescents who are sexually active and become pregnant are psychologically more similar to younger adolescents than to older adolescents who either do not become sexually active or take appropriate precautions not to become pregnant. That is, it may be that for adolescents, having unprotected sex is indicative of a younger psychological developmental stage, where they are not able to assess the likelihood that their actions will result in a child, and the accompanying magnitude and appropriateness of that choice.

Given that these results suggest that all adolescents make similar infant feeding decisions, one interesting suggestion may be that among adolescent mothers the analysis of the relationship between other demographic variables and maternal feeding choices are not influenced by maternal age. Many data collection procedures, including the CDC

data collected for this dissertation, do not collect exact ages of the mothers, rather the mothers are grouped into age categories (<19 years, 20 – 29 years, and 30+ years). A criticism of this procedure is that there may be, as I originally hypothesized, significant differences in the breastfeeding practices between adolescents of different ages. However, these results indicate that there may not be much difference within the adolescent age range in regards to breastfeeding practices. Therefore, it may be unimportant, when investigating adolescent mothers' breastfeeding practices, to collect exact ages among adolescent mothers.

**Race/Ethnicity**

Some previous research has found that, among older mothers, Hispanic mothers breastfeed the most often and African American mothers breastfeed the least often (Li et al, 2005). This study extended previous research by assessing the relationship between ethnicity and breastfeeding initiation and duration among adolescent mothers. I hypothesized that among adolescent mothers, as with older mothers, Hispanic mothers would breastfeed the most often and for the longest duration, and African American mothers would breastfeed the least often and for the shortest duration. Furthermore, I hypothesized that there would be an interaction between age and race with regards to breastfeeding rates, with Hispanic adolescent mothers breastfeeding at rates more similar to their older counterparts, while adolescent mothers of other race/ethnicities would breastfeed at rates far below their older counterparts.

In line with expectations, I found that in the CDC dataset, adolescent Hispanic mothers are more likely to initiate breastfeeding than any other race or ethnicity. I also

found that adolescent African-American mothers are the least likely to initiate breastfeeding. All other races and ethnicities, including Anglo and Asian, fall somewhere between Hispanic and African-American. Also as I hypothesized, adolescent Hispanic mothers initiated breastfeeding at rates far more similar to their adult counterparts than did adolescent mothers of other race/ethnicities. However, counter to expectations, I found that adolescent mothers may breastfeed their children for similar durations regardless of their race/ethnicity.

When looking only at the national sample, one possible explanation for the more normative rates of breastfeeding among adolescent Hispanic mothers is that in Hispanic culture it is more appropriate for adolescents to bear children. It may be that because it is considered acceptable for these young women to be mothers, they are more likely to identify with older mothers' parenting decisions, and breastfeeding is fairly common among older Hispanic mothers. The benefits that this provides may be relatively short-lived once the young woman begins to personally experience the daily demands of parenting, and so she quickly becomes more like her age-cohort rather than like older Hispanic mothers.

The CDC results differed from those suggested in the NP dataset. The results from this smaller, local sample indicated that among adolescent mothers, African-American mothers breastfed the least often, and all other racial/ethnic groups breastfed similarly, both initially and across time. I attribute the differences between these datasets as differences between regional samples. It may be that these two datasets drew on different populations, or that on a national level, Hispanic adolescent mothers breastfeed

the most often, but in the southwest they breastfeed about as often as all adolescent mother groups except for African-American adolescent mothers.

It is interesting to note that, regardless of the ranking of other racial/ethnic groups, African-American mothers breastfeed at decreased initiation and duration rates. This result has been true for all previous research studies, and for both samples analyzed here.

**Maternal Educational Attainment**

Much previous research, and a general rule of thumb used by breastfeeding educators, indicates that there is a positive relationship between maternal education and breastfeeding initiation and duration (Callen and Pinelli, 2004). However, one analysis of the 2001 National Immunization Survey, the same Center for Disease Control (CDC) survey used in this analysis only collected two years prior to the current data, suggested that there might be a non-linear association between maternal education and breastfeeding initiation and duration (Li et al, 2005). However, even though this finding contradicted previous findings, the authors did not remark on it or do follow-up analysis. In fact, the authors chose not to comment at all on the differences in breastfeeding initiation and duration for mothers with no high school diploma and mothers with a high school diploma. The authors simply noted the linear portion of the association, that mothers with a high school diploma were less likely to breastfeed than mothers with higher education. This dissertation expanded on this somewhat contradictory body of research by repeating the analysis with a similar dataset, and by isolating the adolescent population in order to determine if the trend held true for this younger population of mothers. Because of the somewhat contradictory and incomplete literature, I did not

have a firm hypothesis about the correlation between maternal educational attainment and breastfeeding practices.

I found different results from the ones presented in the analysis of the earlier CDC survey. That is, I found that adolescent mothers breastfed their babies for about the same levels of initiation and duration regardless of their educational attainment. It may be that the non-significant results for mothers with some college education were due to the relatively low number of adolescent mothers with any post-high school education. Nevertheless, the similarity in breastfeeding rates for all adolescent mothers, regardless of their educational status, is notable. It may be that adolescent mothers are so young that increased levels of education can not reach a point where they begin to influence their infant feeding decisions.

**Maternal Marital Status**

Previous research has indicated that older mothers are more likely to breastfeed their children if they are married than if they are not married. This study extended previous research by analyzing adolescent mothers to see if marital status has the same influence on infant feeding choices for them as it does for older mothers. I hypothesized that married adolescent mothers would have higher rates of breastfeeding initiation and duration than non-married adolescent mothers. My analysis suggested that being married is correlated with adolescent mothers initiating breastfeeding more often, but is not correlated with extended breastfeeding duration.

It may be that being married is associated with higher breastfeeding initiation rates for adolescent mothers because of the possibility that the adolescent mothers who

are married have already developed beyond some of the typical adolescent issues relating to intimacy and identity. A married adolescent may have, to some extent, accepted a deeply intimate relationship with her spouse, and is therefore more ready to enter into a highly intimate relationship with her baby. Similarly, a married adolescent has already accepted the identity-role of wife, which is closely tied to the role of mother. Another possibility for why being married is positively correlated with increased breastfeeding rates may be that married adolescent mothers are more likely to have planned the baby's birth, and planned pregnancies have been positively related to a number of beneficial factors for both adolescent parents and their children (Leathers & Kelley, 2000). Planned pregnancies have been correlated with higher breastfeeding rates among older mothers (Taylor and Cabral, 2002). It may be that this relationship between planned pregnancy and increased breastfeeding initiation rates extends to adolescent mothers as well.

**Household Income**

Previous research has shown that higher levels of income are related to higher levels of breastfeeding among older mothers (Li et al., 2005). As with maternal educational attainment, the positive correlation between household income and breastfeeding rates is an assumption and a bias that is held by many, if not most, breastfeeding educators and doctors. This study extended previous research by analyzing the relationship between household income and infant feeding choices for breastfeeding mothers. I did not predict what the relationship between the household income and breastfeeding rates would look like for adolescent mothers, given the range restriction with a much lower income for adolescent mothers and their much lower rates of

breastfeeding. I found no relationship between household income and breastfeeding initiation or duration.

These results are particularly interesting given that extensive previous research has suggested a strong relationship between household income and breastfeeding rates. It may be that adolescent mothers and their partners tend to contribute a smaller portion of the household income than older mothers, and are therefore their decisions and actions are less likely to be related to the household income in the same way that older mothers' income is generally perceived to be. Or it may be that the substantially reduced variance accounted for the lack of significance.

**Siblings**

Previous research has been very cursory in describing the relationships between multiple children and mothers' infant feeding choices. One study, using the older CDC survey used in this analysis, seemed to indicate that first-born children were breastfed at lower rates than children with siblings, but perhaps breastfed for a slightly longer time (Li et al, 2005). However, the authors of this research did not discuss the statistical significance of these findings or put them into context. This study extended previous research by looking to see if the results were repeated with only adolescent mothers in the subsequent CDC survey, and moving into a smaller dataset to assess the possible association between number of children and maternal infant feeding choices. Despite previous findings, I hypothesized that children born to adolescent mothers who had no siblings would be breastfed at higher rates and in line with previous findings, for a longer period of time. Similarly, I hypothesized that there would be a negative relationship

between the number of children born to a mother and the likelihood that she would breastfeed her baby.

In line with my expectations, I found that only children born to adolescent mothers were breastfed at increased initiation and duration rates when compared to children with siblings born to adolescent mothers. However, adolescent mothers with more than one additional child did not have lower breastfeeding rates than those with only two children. It may be that there were not enough adolescent mothers who had more than two children total to find a statistically significant difference.

I understand these findings to suggest that adolescent mothers are more inclined to breastfeed when they only have one child because of a reduced level of stressors in their lives. When an adolescent mother gives birth to her second, third, or fourth child, she already has so many demands on her attention that she may not feel able to provide for those additional children in the same way she was able to provide for her first child.

**Neonatal Infant Care Unit (NICU)**

Previous research has suggested that older mothers whose babies are admitted to the NICU are less likely to initiate breastfeeding than mothers with healthy, full-term babies (Hurst & Meier, 2005; Meier et al, 2000). This study extends this work by investigating whether adolescent mothers make different choices than older mothers when their babies are admitted into the NICU. Based on a lack of evidence to suggest otherwise, I hypothesized that adolescent mothers' infant feeding decisions would be similarly impacted by the NICU environment as older mothers' infant feeding decisions are, and would breastfeed at lower rates if their babies were in the NICU.

Contrary to expectations, I found that babies of adolescent mothers are more likely to be breastfed initially if they are admitted into the Neonatal Infant Care Unit (NICU). However, by three months postpartum, babies who were admitted to the NICU are breastfed at the same rates as babies who were not admitted to the NICU.

These results are opposite of what has been observed in previous research conducted with older mothers whose babies are admitted into the NICU. Given that these results are so radically different for the adolescent mother population, more investigation is highly warranted. One possible explanation may be that adolescent mothers benefit more fully than older mothers from the increased care and attention from nurses and doctors in the NICU environment. Another possible explanation may be that adolescent mothers benefit from the increased distance that is established between mother and baby when the baby is admitted to the NICU, and is therefore able to give more time and energy to breastfeeding and/or pumping. A third possible explanation may be that the particular NICU environments where the data was gathered different in some substantial way from NICUs where previous studies have taken place. However, these are only three possibilities in a wide and diverse world of potential explanations.

**Birth Method**

The only research I have found addressing a correlation between breastfeeding rates and birth methods looked at hospital-wide correlations rather than individual correlations, and only investigated the correlations at the time the mother checked out of the hospital, rather than over time. This previous analysis suggested a positive relationship between vaginal birth rates and breastfeeding rates upon maternal checkout

from the hospital. Therefore, I hypothesized that adolescent mothers who delivered their babies vaginally would choose to breastfeed more often than mothers who delivered their babies through a c-section. In line with expectations, adolescent mothers who had a vaginal birth were more likely to breastfeed their babies initially, and more likely to breastfeed their babies for a longer time, than adolescent mothers who had a c-section.

While very little is known about the possible correlations between a baby's birth method and the mother's feeding choice, the current analysis indicates a clear relationship for adolescent mothers. One possible explanation of these findings is that the experience of the major surgery involved in a c-section may discourage mothers from the physical demands that are required by breastfeeding. However, it may be the case that mothers who are more knowledgeable about the physical benefits associated with vaginal birth and who are inclined to work to reap those benefits are also more knowledgeable about the benefits associated with breastfeeding and are more inclined to work to reap those benefits as well.

**Birth Hospital**

There has been very little research on the relationship of birth hospital to mothers' infant feeding choices. Only one study investigated this relationship, and they documented that a significant amount of variance in breastfeeding rates was contributable to the birth hospital. I originally hypothesized that there would not be any different in breastfeeding rates for adolescent mothers between birth hospitals due to the relative homogeneity of the group. Nevertheless, I found that mothers who gave birth to their

babies at Hospitals 1 and 2 breastfed at significantly lower rates and for a significantly shorter duration than mothers who gave birth to their babies at Hospitals 3 and 4.

These results are relatively surprising, given the differences and the direction of the differences between the two groups of hospitals. The two hospitals that had the lowest rates of breastfeeding both have lactation consultants on staff to assist mothers with learning how to breastfeed. The two hospitals that had higher rates of breastfeeding do not have lactation consultants on staff, nor are the nurses trained to encourage breastfeeding.

However, there are important differences between the populations who utilize the different hospitals that may account for some of the feeding differences. The mothers who give birth at Hospital 4, which has the highest rate of breastfeeding, are 90% Hispanic. The mothers who give birth at Hospital 3, which has similar breastfeeding rates to Hospital 4, are 60% Hispanic. However, because of the Type 3 analysis used, this difference in racial make up of the sample was controlled for. Therefore, the statistical differences between adolescent mothers' breastfeeding rates between the hospitals existed on top of differences between racial groups.

### ADOLESCENT MOTHERS' REASONS FOR THEIR INFANT FEEDING DECISIONS

Previous research investigating adolescents' beliefs and decision-making about breastfeeding has been relatively extensive (Wambach & Cole, 2000). These studies have, to a large degree, found that adolescent mothers give similar reasons as adult mothers for why they choose a particular feeding method, including psychological or

physical discomfort, body issues, the need to return to work or school, social/cultural issues, baby's health, or mother-infant attachment (Baisch, Fox, & Goldberg, 1989; Baisch, Fox, Whitten, & Pajewski, 1989; Maehr, Lizarraga, Wingard, & Felice, 1993). However, the majority of this research did not categorize these reasons into meaningful groups. One study suggested that adolescent mothers tend to choose more self-oriented reasons for infant-feeding choices than older mothers (Yoos, 1985). While Yoos' grouping of the reasons behind maternal infant feeding choices into two categories may be useful, the groups were designated by the researcher, rather than growing meaningfully out of the participants' responses. Furthermore, previous research has not investigated how adolescent mothers' decision making is possibly related to either their actual feeding methods, their race/ethnicity, or the birth hospital. This study extended previous research by organizing adolescent mothers' stated reasons for their infant feeding method into distinct, meaningful categories which may enable researchers to code and analyze the psychological decision-making processes of adolescent mothers more effectively. Additionally, this study investigated the correlations between adolescent mothers' stated reasons for their infant feeding method with the infant feeding method they used at birth and at three weeks postpartum, which was when the question was asked. Finally, this study assessed whether there was a relationship between adolescent mothers' reason for their infant feeding method and race/ethnicity and birth hospital.

I found that participants' reasons for their infant feeding decisions could be categorized into four meaningful groups: (1) external suggestion, (2) intrinsic to feeding

method, (3) the other method didn't work, and (4) doesn't know. The distribution between these groups was uneven, with 17% choosing their feeding method because of external suggestion, 25% because of reasons intrinsic to their feeding method of choice, 54% because the method they first tried didn't work, and 4% did not know why.

There are several particularly interesting trends in these results. Perhaps the most remarkable result is the percentage of mothers in each category who changed feeding methods during the first three weeks postpartum. The adolescent mothers who chose to feed their infants a certain way because of some external suggestion, by and large, did not change feeding method over the first three weeks postpartum. Adolescent mothers who cited reasons intrinsic to a given feeding method moved slightly towards formula, although 70% of these mothers still breastfed at least sometimes. The other two categories of reasons adolescent mothers gave for breastfeeding, that the other method didn't work and they didn't know, changed from favoring breast milk to almost exclusively feeding formula.

These results seem to suggest that adolescent mothers who make a feeding choice based on external suggestion, or rather based on influence from other people, are more likely to stay with their original feeding decisions. However, adolescent mothers who cited concrete, intrinsic reasons for their feeding decisions also, by and large, continued with their original feeding choice. It may be that for adolescent mothers, making a decision based on an external influence provides them with additional support and therefore allows them to commit to parenting decisions they might otherwise not be able to stick to. However, the adolescent mothers who made their infant feeding decision

based on the qualities of the feeding method itself may be more mature and capable of weighing the potential results of a parenting choice, and are therefore more likely to stay with their original decision.

Aside from the change in feeding method within each category, it is important to note that almost half of the mothers in this qualitative dataset said they started breastfeeding, but then stopped, because breastfeeding did not work for them for a variety of reasons. This is a very striking trend, which brings up a number of questions. First, how much support were these mothers receiving in their attempts at breastfeeding? Second, would more support have provided more breastfeeding success? Third, would adolescent mothers benefit from a qualitatively different kind of breastfeeding support than is typically offered to older mothers? Finally, does breastfeeding provide for a healthy proportion of a gain/loss ratio for adolescent mothers?

## LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The datasets used in this analysis were not ideal samples. The NP dataset had clear drawbacks, particularly with regards to its strongly localized generalizability. The adolescent mothers from this sample, while comprising the majority of children born to adolescent mothers in the small, southwestern city the sample was gathered in over the collection period, the results cannot be applied with any certainty to other groups of adolescent mothers.

The national dataset collected by the Centers for Disease Control and Prevention also is not truly representative of adolescent mothers on a national level. While the CDC is typically very good at obtaining representative samples, this dataset included only 2%

of adolescent mothers, while nationally births to adolescent mothers comprise about 11% of all births. A closer analysis of the sample indicates further problems, including a non-representative sampling of racial/ethnic groups within the adolescent mother population. Comparing percentages of adolescent birth rates by race from 2001 (Martin et al, 2002) to the sample used in this analysis, Anglo adolescent mothers were far underrepresented in this sample, while every other racial/ethnic group was overrepresented.

While it is regrettable that neither of these datasets is truly representative of the national adolescent mother population, such a sample is particularly hard to come by. Adolescent mothers are notoriously difficult to find. Therefore, it may be that using non-representative datasets offer the best available method of assessing adolescent mothers.

An additional limitation of this study is that it has only begun to scratch the surface of understanding adolescent mothers' infant feeding choices. Much more research is necessary to understand why some adolescent mothers are able to exclusively breastfeed their infants for 6 months and continue for 12 months, as recommended by the American Academy of Pediatrics, and most others are not.

There were a number of variables this analysis could not take into account that may have a significant impact on adolescent infant feeding choices. For example, previous research has indicated that there is a negative correlation between breastfeeding initiation and the intention of the mother to become pregnant. That is, mothers who intend to become pregnant are significantly more likely to breastfeed than mothers who do not intend to become pregnant (Taylor and Cabral, 2002). This may be particularly relevant to adolescent mothers' breastfeeding practices because they are much less likely

to become pregnant intentionally than older mothers (Chandra et al, 2005). However, there have been no studies to date that have investigated the relationship between pregnancy intentionality and infant feeding practices in adolescent mothers.

This study found that only the correlation between marital status and infant feeding method is the same for adolescent mothers as previous research states it is for older mothers. It may be that because of the extensive research on marital status and infant feeding method with older mothers, and because adolescent mothers seem to have similar trends, that more research in this area is not needed. The other results in this study, however, present a myriad of questions many of which were not within the scope of this dissertation to answer, and others have come to light through this analysis.

**Adolescent Mothers' Differences from Older Mothers**

This study suggests there are several associations between an adolescent mother's demographics and her feeding choices that are different from the relationships between the same variables and older mothers' infant feeding choices. These variables specifically include race/ethnicity, Neonatal Infant Care Unit (NICU) admission status, household income, maternal educational attainment, and birth hospital.

This analysis suggests that adolescent mothers' race/ethnicity is correlated with their infant feeding choices differently than it is for older mothers. It may be informative to assess the experiences and decision-making processes for adolescent mothers with different racial/ethnic backgrounds in order to provide further insight into these results. For example, it may be interesting to investigate whether adolescent mothers take on

older mothers' behaviors to the degree to which a particular racial/ethnic group considers adolescent childbearing to be appropriate.

Also of interest are the maternal infant feeding decisions made by mothers whose babies were admitted to the NICU. Given the very different results from this study when compared to results from studies with older mothers, the question of how and why this difference exists looms large. In-depth, qualitative interviews and ethnographic research may begin to shed light on this intriguing different reaction to the NICU environment between adolescent and older mothers.

Another important avenue for future research involves looking more closely at household income to investigate why it is not significantly related to adolescent mothers' choice to breastfeed, particularly when it is considered such an important variable for older mothers.

The relationship between educational attainment at the very low levels and breastfeeding rates appears to be insignificant for adolescent mothers. One interesting point to examine closely is whether other variables, such as maternal age or marital status, are actually moderating the correlation that education has with breastfeeding rates.

The relationship between birth hospital and feeding method is an intriguing one. It suggests that there are ways that birth hospitals influence mothers' choices, even once the mother has returned home. The hospitals and the differences between them presented here are particularly intriguing. The two hospitals with the lower breastfeeding rates had more amenities generally associated with higher breastfeeding rates, including lactation consultants, while the two hospitals with the higher breastfeeding rates had no such

amenities. However, there were significant population differences between the four hospitals, which may have accounted for some of the differences in breastfeeding rates. A study focused on the correlation between birth hospital and maternal infant feeding choice may indicate the importance of unforeseen elements that are not generally associated with higher breastfeeding rates. Two possible examples of this may be a lower mother-to-nurse ratio or even something as simple as comfortable rocking chairs being placed in the mothers' rooms. A closer investigation into the exact practices of birth hospitals, in the form of a study that matches demographically similar mothers from different hospitals to see their breastfeeding patterns, may enable a more thorough discussion of the aspects of a hospital birth that could contribute to higher breastfeeding rates.

There may also be something of a cumulative effect with these variables. As a mother gets older, she is more likely to be married, have a higher household income, and have higher levels of education. Analyzing the relationships between these many variables through path analysis may produce interesting and informative results.

**Variables Not Previously Studied**

There were two variables that stood out as needing additional research because they had not been previously studied, and one of these variables indicated results that were counter to the hypotheses. The two previously unstudied variables were birth method and the similarity in infant feeding practices between younger and older adolescent mothers.

Birth method (i.e., vaginal or cesarean section) has not been previously studied as a factor in maternal infant feeding. While the results here indicated a significant relationship between these two variables, follow-up may enable researchers to delve into the specific birth situation in each mother/infant dyad. It may be that higher rates of breastfeeding are associated with vaginal births because mothers who want to give birth vaginally are more likely to want to breastfeed. However, it is also possible that the physical strain caused by a cesarean section reduces a mother's ability or inclination to breastfeed. The second of these possibilities may have serious implications for the medical field and how they approach the decision to do a cesarean section rather than encouraging the mother to continue to labor and birth vaginally. It may also be interesting for researchers to investigate whether this trend holds true for older mothers as it does for adolescent mothers.

The similarity in maternal choices about infant feeding methods that both younger and older adolescent mothers make is striking, and suggests more questions than it answers. For example, a study that actually tested maternal psychological development, rather than using age as a supplement, and tested the correlation with infant feeding practices may find different results. Other questions include, does this similarity hold true for other types of parenting choices as well? Due to the substantial nature of adolescent psychological development, it may seem that older adolescents, 18 or 19 years old, are probably more suited for making appropriate, child-centered parenting decisions than younger adolescents, 14 or 15 years old. In the case of feeding decisions, however, this does not appear to be true. Further research investigating other areas of parenting

may provide interesting results that could affect the way adolescent mothers, regardless of their age, are approached by the health and social service fields.

Possibly the most intriguing of the questions that this research brings to light, however, is the notably low breastfeeding rates among adolescent mothers, coupled with the fact that a large percentage of adolescent mothers stop breastfeeding because they believe that breastfeeding does not work for them. This percentage is clearly contradictory to the medical community's statement that an overwhelming majority of women and their babies are physically able to breastfeed, regardless of maternal age (Gartner and Black, 1997). Therefore, adolescent mothers may be interpreting an emotional and/or psychological inability to engage in the breastfeeding relationship as their body's and/or their baby's body's physical inability to breastfeed. Therefore, I believe it is critical that the social and health fields ask if there are psychological developmental costs associated with breastfeeding for adolescent mothers. Research has clearly indicated that there are psychological benefits associated with breastfeeding for older mothers and their children. Do these same benefits hold true for adolescent mothers? Once a deeper understanding of the prior two research questions has been reached, we may be able to assess if the benefits associated with breastfeeding are undermined by the developmental costs for adolescent mothers.

The future research questions suggested here have the potential to dramatically impact the way adolescent mothers are approached by both the social services and medical fields.

## CONCLUSION

This dissertation contributed to the base of knowledge on adolescent mothers' infant feeding choices and the correlations between those choices and a variety of maternal and child demographic variables. Specifically the findings presented here suggest that adolescent mothers are distinctly different from older mothers. While there are some similarities between younger and older mothers' infant feeding decisions (i.e., the reasons they provide for their decisions, and the correlation between marital status and their feeding decisions), there are also significant differences between adolescent mothers' and older mothers' feeding decisions that may not be evident when simply extrapolating younger mothers' behavior from older mothers' behavior (i.e., the correlation between race/ethnicity or the impact of a baby's NICU admission status and maternal feeding decisions).

These results challenged some of the common assumptions regarding the strength of the relationship between several demographic variables and which mothers are more likely to initiate breastfeeding and breastfeed for longer. First, that increased levels of education are positively associated breastfeeding initiation and duration, even at the lower ends of the education scale. Second, that there is a positive relationship between household income and breastfeeding initiation and duration.

The results also speak directly to the disturbing point that adolescent mothers and their children, who have the most to gain from the benefits associated with breastfeeding, are the least likely to form and maintain a breastfeeding relationship over any prolonged period of time. Given the benefits associated with breastfeeding, and the notable deficits

which exist in many families headed by adolescent mothers, a real understanding of the demographic and psychological variables associated with increases in adolescent mothers' breastfeeding rates may provide for substantial improvements in education and services for adolescent mothers and their families.

# Appendix

A complete list of mothers' qualitative, unguided responses to the question: "Why did you feed your baby _____?"

1. Because he wouldn't nurse after he had the bottle, he liked the bottle better. I didn't pump because it's too hard
2. Because everyone does. My mom nursed me, and it's the healthiest way.
3. He wouldn't get any milk out, so I was pumping, but then I couldn't get any more out. So I just started giving him formula.
4. They say breastmilk is better for him and he'll get less sick. But he sleeps better at night with formula, so I give that to him then.
5. I talked with my mom, and decided formula would better because breastfeeding would be too hard and I had to go back to school already.
6. Well, I wanted to breastfeed, but I started pumping because she wasn't getting enough, and now I'm not getting much milk out any more, so I just give her formula when I can't get any.
7. I don't know why, but I just don't like breastfeeding
8. I didn't have any breastmilk.
9. Breastfeeding wasn't comfortable, and I didn't want what I was eating to be bad for the baby. Like if I had some candy or something or didn't eat anything good that day.

10. My baby got overwhelmed with breastfeeding. It just wasn't for us.
11. Because then it's easier to leave the baby with other people.
12. I gave her formula because she wasn't getting it out right when she was nursing.
13. After he started on the bottle, he couldn't get any milk from me. I tried the pump, but it didn't work.
14. She wasn't breastfeeding right and it hurt, so I gave her formula instead.
15. Formula is easier. I was pumping, but it was really hard.
16. I didn't have enough milk, it was going away when I was in the hospital after he was born.
17. I tried to breastfeed to see if I could do it, but then I got sick, so I switched to formula.
18. Well, because it's healthier, immunities and things like that. It's also cheaper. And formula babies smell funny and I didn't want my baby to smell funny like that.
19. The baby didn't want to take breastmilk any more.
20. I didn't think he was getting full on breastmilk. I still don't think he's getting full with the formula cause he's crying.
21. My mom said it was the best thing. That it was healthier for her.
22. Because it's better for her, she won't get as sick. That's what my mom told me.
23. Formula was easier.
24. Oh, because she wasn't taking to breastfeeding all that well.

25. Because it's good for babies. But she's still hungry then, so I give her some formula.
26. I just didn't feel comfortable with breastfeeding. I don't know why, it's just the way I felt. But then when she was a week old, I ran out of formula, so I tried it. It wasn't too bad. So whenever I don't have formula or whatever, I'll do it instead.
27. I use formula because I tried to breastfeed my older son. It didn't work out, so I didn't want to try it this time and then have to switch back again.
28. I tried the breastfeeding thing, and it hurt, so I just use formula then.
29. I couldn't keep up with both kids and nurse, so I just use formula. I needed more sleep.
30. I just felt like I would be uncomfortable breastfeeding, so I went with formula.
31. When we were in the hospital, one of my friends fed him with a bottle, and he got confused. So I switched to formula after one day.
32. I don't have time to breastfeed.
33. I didn't want to 1er with the breast. I just didn't do it.
34. I wanted to breastfeed so I could bond with her more and because it was best for her. But then she wouldn't latch on right and I was worried she wasn't getting enough. That's why I pump now and give her both.
35. She didn't like breastfeeding.
36. I wasn't sure about breastfeeding. So I just used formula.
37. Because it helped my other baby to be healthy. But she's having trouble getting on right.

38. I wasn't making enough milk for him and I was going back to school.

39. I went back to school.

40. Everyone said it's so much better and healthier for him.

41. Breastfeeding hurt, so I just gave her formula.

42. My older son was jealous. Breastfeeding him was also really hard, so I didn't want to do it again with her.

43. Because it's healthier for the baby.

44. I don't really know why.

45. It was too hard to breastfeed both of them. <<Mother had twins.>>

46. I don't know why, I just did.

47. I was sick and had a high fever. So after the fever went away, she couldn't get any out anymore. So I just went with the bottle.

48. He likes to nurse, so I do that sometimes. I also give him formula sometimes because my other son gets jealous when he nurses.

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